



POWERSCAN™
D8330/M8300
USER MANUAL

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ISO 9001 Certified
Quality Management System

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2100 Meadowvale Boulevard

Mississauga, Ontario, Canada L5N 7J9

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Worldwide Offices

Company Headquarters

Psion Inc.

2100 Meadowvale Boulevard

Mississauga, Ontario, Canada L5N 7J9

Tel: +1 905 813 9900

Fax: +1 905 812 6300

E-mail: salescdn@psion.com

North American Headquarters & U.S. Service Centre

Psion Corporation

3000 Kustom Drive

Hebron, Kentucky

USA 41048

Tel: +1 859 371 6006

Fax: +1 859 371 6422

E-mail: salesusa@psion.com

International Subsidiaries

www.pSION.com/us/about/contact_pSION-offices.htm

Psion S.A.

La Duranne

135 Rue Rene Descartes

BP 421000

13591 Aix-En-Provence

Cedex 3; France

Tel: +33 4 42 90 88 09

Fax: +33 4 42 90 88 88

E-mail: tekeuro@psion.com

Psion Espana S.L.

Plaza de la Pau, s/n Edificio 3, 2º

08940 Cornellà de Llobregat,

Barcelona, Spain

+34 902 884 220

+34 934 750 230

ptxspain@psion.com

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GENERAL VIEW

POWERSCAN™ D8330/M8300 READERS



Figure A - PowerScan™ D8330/M8300 Series Reader

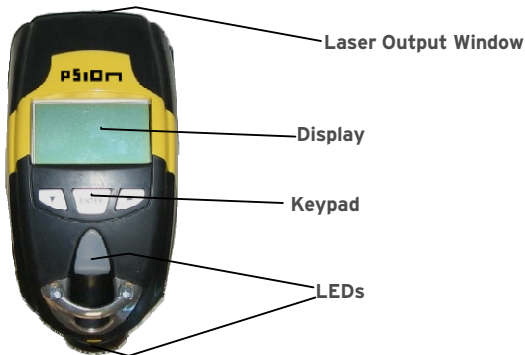


Figure B - PowerScan™ M8300 Series Reader with Display

BC-80X0 / C-8000 CRADLES



Figure C - BC-8000

The label on the cradle contains LED indicators and a scan finder button. When the button is pressed, the cradle transmits a “broadcast” message. All properly configured scanners (Radio RX Timeout set to keep the radio “awake”) linked to that base (through a bind or a join sequence) and within radio range coverage will emit a beep sequence once every 2 seconds for 30 seconds. A scanner is considered to be linked when the last transmission ends properly.

The scan finder works only in stand-alone layout (point to point or multiple readers).



Figure D - C-8000

1 INTRODUCTION

PowerScan™ D8330 and **PowerScan™ M8300** offer unsurpassed robustness and ergonomics: clearly audible beeper and bright "good read" LEDs assist in areas where noise levels are normally high; the aim mode, which helps point to the right code, has now been extended to the whole PowerScan™ family. Optical parts are completely suspended on shock absorbers and a careful choice of the body materials, such as the co-moulded rubber, protect the PowerScan™ from damage due to falls.

New enhanced architecture, based on an M16 high-speed microprocessor, enables exceptional performance for promptness and reading speed of standard codes as well as the ability to read poorly printed and damaged codes. Patented Puzzle Solver Technology™ adds further strength to the PowerScan's powerful engine.

In all applications where mobility is a value, the new PowerScan™ M8300 represents the key to increase productivity and flexibility in the working area. PowerScan™ M8300 communicates through a low power, license free radio in the 433 MHz band (910 MHz for USA version) and allows bi-directional communication between the base station and the host. PowerScan™ M8300 also includes a display and a 3-key push-button keypad. Thanks to these features, the operator can receive information from the host, interact with the central system and visualize the code read. The cordless system offers scalable solutions to solve simple applications and complex projects:

- Point to point: each reader is associated with its own base station;
- Multipoint: up to 32 readers transmit data to one base station;
- Network: to cover a wide area, connecting up to 16 bases and 512 readers simultaneously working in automatic roaming.

PowerScan™ M8300 is 100% compatible with STAR-System™, the Psion RF narrow band solution for mobile applications that provides the widest family of narrow band devices on the market.

Your PowerScan™ reader is supplied with its own Quick Reference Guide, which provides connection, diagrams, reading diagrams, basic application parameter settings, default values, and specific technical features. You can use either the Quick Reference Guide or this Manual for initial configuration in order to set the default values and select the interface for your application. This manual provides all the necessary information for complete mechanical installation and system software configuration.

2 INSTALLATION

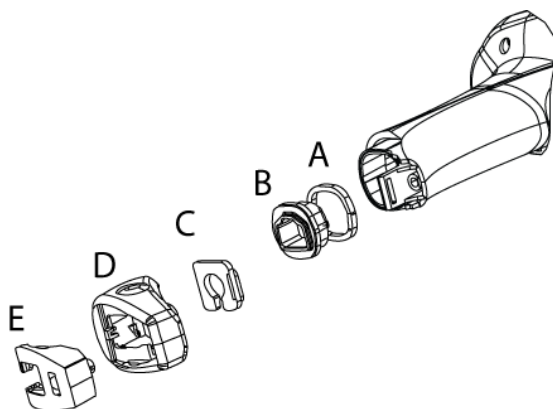


CAUTION

Connections should always be made with power OFF!

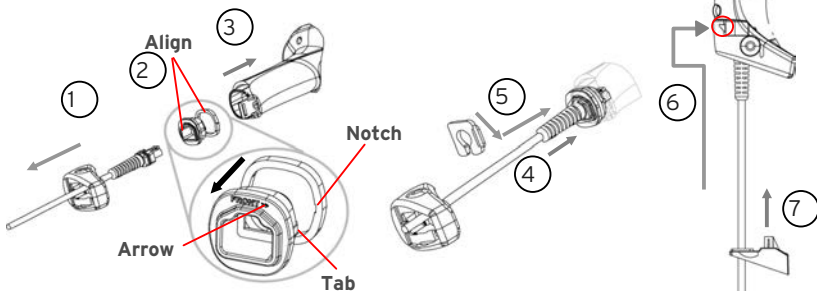
2.1 POWERSCAN™ D8330 INTERFACE CABLE CONNECTIONS

The PowerScan™ D8330 reader incorporates a multi-standard interface, which can be connected to a Host by plugging the correct interface cable into the connector and closing the cable cover.



- A. Rubber gasket
- B. Plastic boot
- C. Cable spacer
- D. Cover
- E. Strain relief

Follow the given procedure for correct cable insertion:



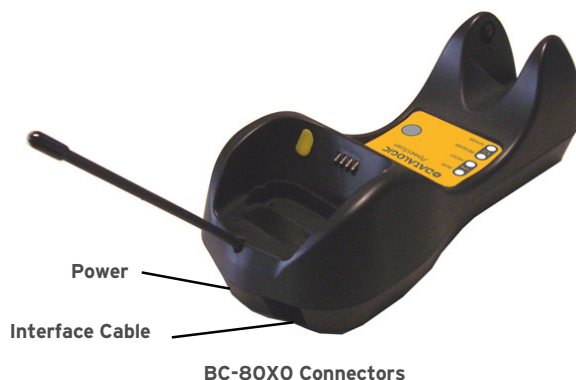
- ① Slip the cover over the cable.
- ② Push the plastic boot into the rubber gasket. Take care that the tab on the plastic boot is aligned with the notch in the rubber gasket.
- ③ Push the plastic boot and gasket into the handle. Ensure that the "Front" marking on the plastic boot is facing out, with the arrow pointing towards the front of the scanner.
- ④ Insert the cable into the socket of the plastic boot.
- ⑤ Insert the cable spacer into the cable wire and slide it towards the handle.
- ⑥ Push the cover along the cable towards the reader, and hook it over the yellow "tooth".
- ⑦ Insert the strain relief into the cover and tighten the screw to fix the whole assembly to the reader handle.



CAUTION

Connections should always be made with power OFF!

2.2 BC-80X0 INTERFACE CABLE CONNECTIONS



The BC-80X0 incorporates a multi-standard interface, which can be connected to a Host by simply plugging the correct interface cable into the Host connector, placed on the base of the cradle. In addition the cradle must be connected to an external power supply.



Disconnecting the BC-80X0 Cable

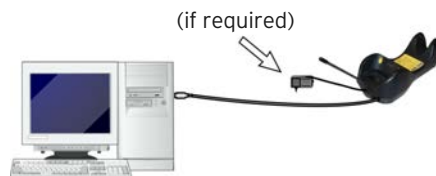
To disconnect the cable, insert a paper clip or other similar object into the hole corresponding to the Host connector on the body of the cradle.

Push down on the clip while unplugging the cable.

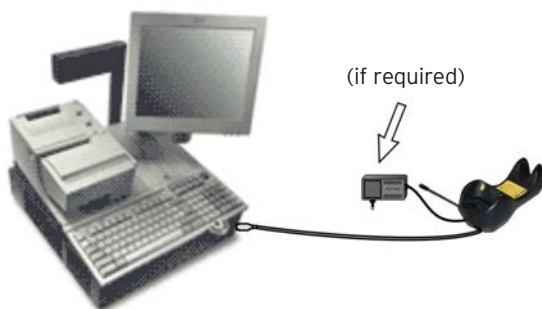
2.3 RS-232 CONNECTION



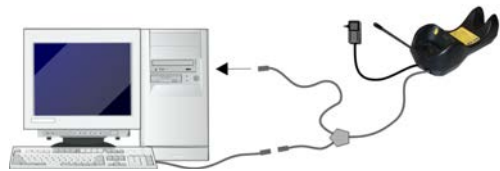
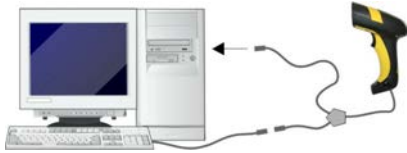
2.4 USB



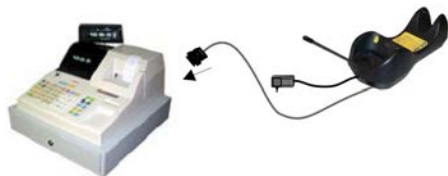
2.5 IBM USB POS



2.6 WEDGE CONNECTION



2.7 PEN EMULATION CONNECTION



2.8 NETWORK CONNECTIONS

2.8.1 BC-8060 Network Connectors

The multidrop network is a bus system which is propagated from one BC-8060 cradle to another using individual cables. This is possible thanks to the RS-485 connector on the front panel of the cradle.



All cradles are connected together within the bus system through the Psion RS-485 splitter cable (CAB-428, part number 90A051950), which must be inserted in the RS-485 cradle connector.

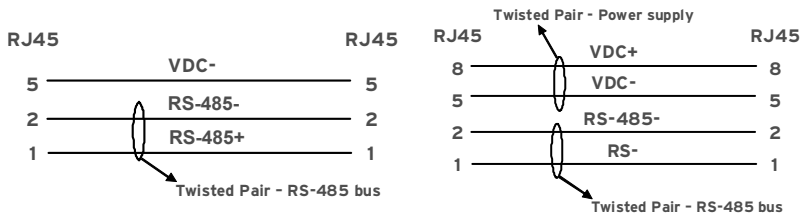
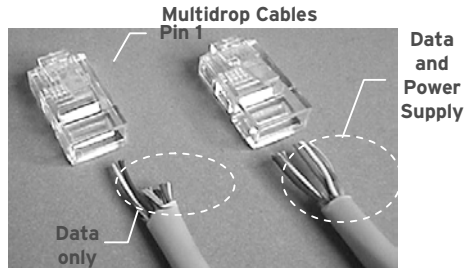
Cable length is to be kept to a minimum, as with all bus systems.

2.8.2 Network Cabling

The Multidrop line is made using RJ45 connectors and a cable having the following specifications:

- twisted pair AWG 24 wires
- 120 Ω impedance
- maximum network cable length 1200 meters

Pin	Function
1	RS-485 +
2	RS-485 -
3	N.C.
4	VDC -
5	VDC -
6	N.C.
7	VDC +
8	VDC +



When wiring the multidrop cables, note the following:

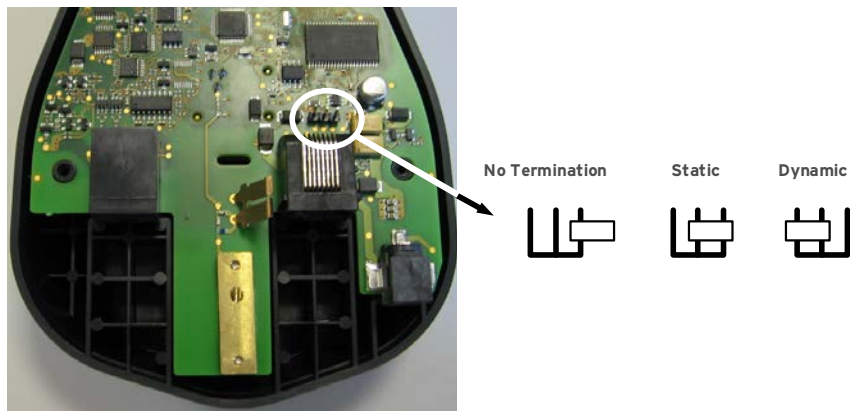
Pin 8 (or 7) can be connected only if the power has to be propagated from a cradle to a STARGATE™ base station or STAR-Box™ converter via the cable.

Pins 5 (or 4) should always be connected as reference ground.

To avoid excessive voltage drop, it is recommended not to propagate power between BC-8060 cradles when used as battery chargers but to supply each cradle individually. The total number of devices, which can be connected to a single power supply, depends on the power supply voltage, the wire length and resistance and therefore the voltage drop. Do NOT connect VDC+ between network devices that are individually powered.

2.8.3 Network Termination

The first and last cradles of the chain (the two ends of the bus) must be properly terminated. The cradle has an internal terminator that can be selected via jumper. For this selection you must open the device.



Terminator for Multidrop Network

Static termination works for all network configurations. However, the network is always under load even when no data transmission takes place.

Dynamic termination can be used for baud rates at or above 38400 and provides less load on the network when idle.

2.9 POWERSCAN™ M8300 BATTERY MAINTENANCE

2.9.1 Battery Charging

Once the system is connected and powered, you can place the PowerScan™ M8300 into the cradle to charge the battery.

When the reader is correctly inserted in the cradle, the "Reader" red LED on the cradle goes on to indicate that the battery is charging. The "Reader" green LED on the cradle goes on when the battery is completely charged.

2.9.2 Replacing PowerScan™ M8300 Batteries

To change the batteries in your PowerScan™ M8300 scanner, press the black button or unscrew the fixing screw on the handle cover and extract the battery pack from the reader handle.



NOTE

When the batteries are extracted from the scanner, the timer maintains the current hour and date for about 1 minute.

Replace the old battery pack with a new one by inserting it within the reader handle and pushing it until it clicks.



WARNING

Do not incinerate, disassemble, short terminals or expose to high temperature. Risk of fire, explosion. Use specified charger only. Risk of explosion if the battery is replaced by an incorrect type. Dispose of the batteries as required by the relevant laws in force.

2.10 MOUNTING THE BC-80X0 / C-8000 CRADLE

The cradle package contains the following items:

- BC-80X0 / C-8000 Cradle
- BC-80X0 Quick Reference / C-8000 Quick Reference
- BC-8000 Antenna
- 2 wall-mounting lock hinges
- 2 adhesive strips
- 4 rubber feet
- 1 horizontal base
- **1 inclined base**

The cradle (either BC-80X0 or C-8000) can be mounted for portable or fixed desktop usage, or it can be fixed to a wall. The horizontal base allows portable and fixed desktop usage, while the inclined base provides desktop and wall mounting guaranteeing a comfortable handling of the PowerScan™ M8300 reader.



BC-80X0/C-8000 Cradle mounted on the Horizontal Base

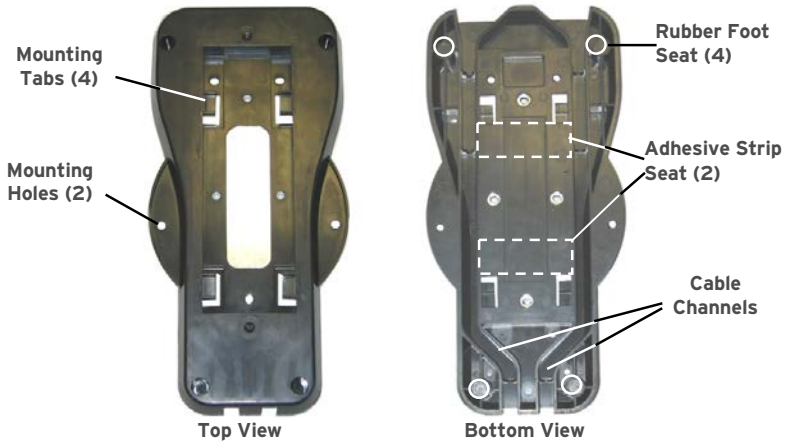


BC-80X0/C-8000 Cradle mounted on the Inclined Base

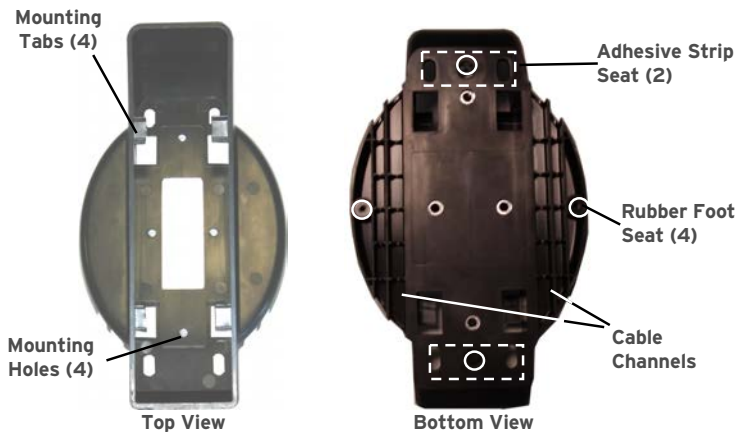
2.10.1 Desktop Mounting

For desktop usage, you can mount the cradle either on the horizontal base, for reduced overall dimensions, or on the inclined base for a more ergonomic taking out and insertion of the reader onto the cradle.

HORIZONTAL BASE



INCLINED BASE



Portable Desktop Use

1. Correctly position the BC-80X0/C-8000 onto the base by sliding it along the mounting tabs until aligned.



2. Carefully clean the rubber foot seats of the base to remove any impurities that could reduce adhesion.
3. Remove the protective plastic from the rubber feet and stick them onto the bottom surface of the base.
4. If mounting the BC-80X0 cradle, insert the antenna in the appropriate hole in the body of the cradle and screw it clockwise until tight.

Fixed Desktop Use

For fixed desktop installation, use the adhesive strips or fixing screws (not provided) according to your needs.

For mounting with adhesive strips:

1. Position the cradle onto the base by sliding it along the mounting tabs until aligned.
2. Carefully clean the adhesive strip seats of the base to remove any impurities that could reduce adhesion.
3. Remove the protective plastic from one side of the adhesive strips and stick them onto the base surface.
4. Position the cables to be connected to the BC-80X0/C-8000 cradle along the dedicated channels, as shown in the figures below:



5. Remove the plastic from the other side of the strips and affix the base to the table.
6. If mounting the BC-80X0 cradle, insert the antenna in the appropriate hole on the body of the cradle and screw it clockwise until tight.

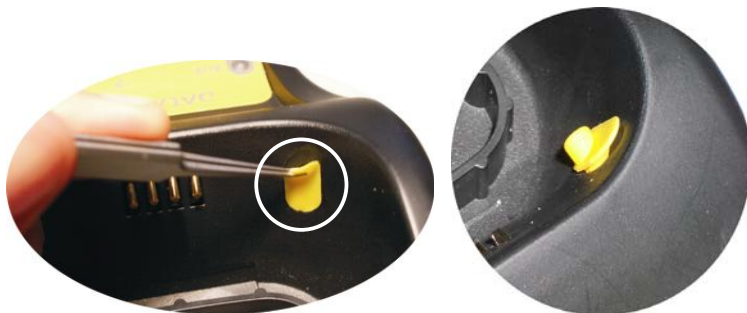
For mounting with screws:

1. Position the cables to be connected to the BC-80X0/C-8000 cradle along the dedicated channels, as shown in the figures below:
2. Position the base on the table and affix it by means of the screws (not provided).
3. Position the cradle on the base by sliding it along the mounting tabs until aligned.
4. If mounting the BC-80X0 cradle, insert the antenna in the appropriate hole on the body of the cradle and screw it clockwise until tight.

2.10.2 Wall Mounting



1. Remove the yellow caps and insert the two wall mounting lock hinges provided with your cradle.



2. Position the cables to be connected to the BC-80X0/C-8000 cradle along the dedicated channels (see figures on page 14).

If using the adhesive strips:

3. Carefully clean the adhesive strip seats of the base to remove any impurities that could reduce adhesion.
4. Remove the protective plastic from one side of the adhesive strips and stick them onto the base surface.
5. Remove the plastic from the other side of the strips and affix the base to the wall as indicated in the figure below.

If using the mounting screws:

3. Using the mounting holes on the base as a pattern, mark the wall where you desire to mount the BC-80X0/C-8000.
4. Drill the appropriate size holes and insert the threaded dowels (not provided) into the holes.
5. Position the base on the wall as indicated in the figure below and affix it by means of the screws (not provided).



Inclined Base Wall-mounting

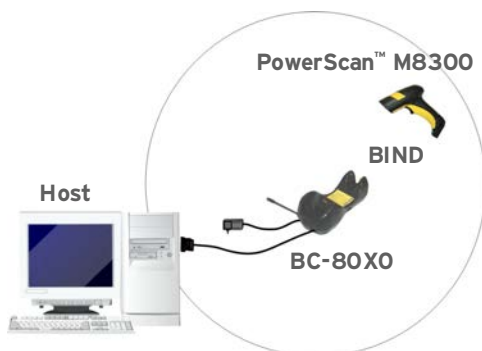
6. Attach the cradle on the base by sliding it along the mounting tabs until aligned.
7. If mounting the BC-80X0 cradle, insert the antenna in the appropriate hole on the body of the cradle and screw it clockwise until tight.

3 POWERSCAN™ M8300 SYSTEM AND NETWORK LAYOUTS

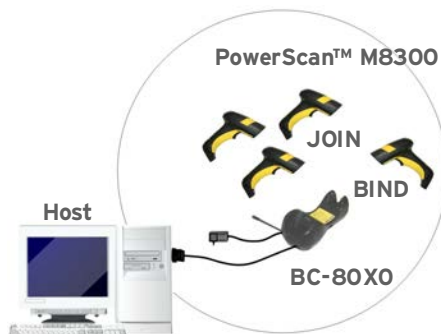
There are two basic system layouts that can be employed: Stand-alone systems (including Point-to-Point layouts) and Multidrop STAR-System™ Networks.

3.1 STAND-ALONE LAYOUTS

3.1.1 Point-to-Point Reader Layout



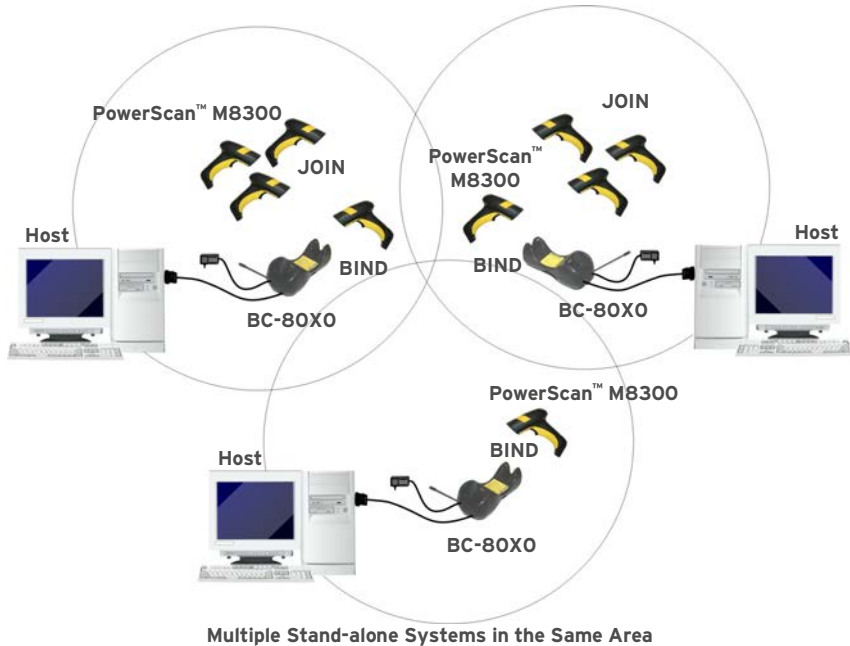
3.1.2 Stand-Alone Layout with Multiple Readers



In stand-alone systems, each cradle is connected to a single Host.

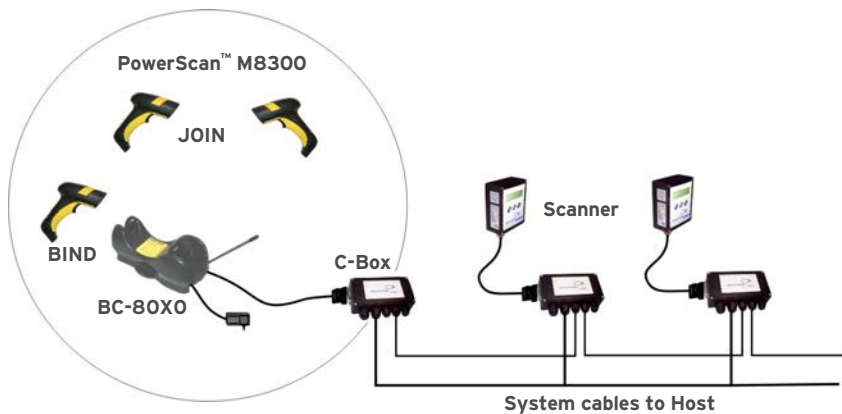
3.1.3 Multiple Stand-Alone Layouts

Many stand-alone connections can operate in the same physical area without interference, provided all readers and cradles in the system have different addresses.



Since the cradles can communicate to multiple PowerScan™ M8300 readers, you might find it useful to employ one or more C-8000 battery chargers in addition to the BC-80X0 cradle, so that the battery re-charging operation can be performed for several scanners at the same time.

3.1.4 C-BOX Layout



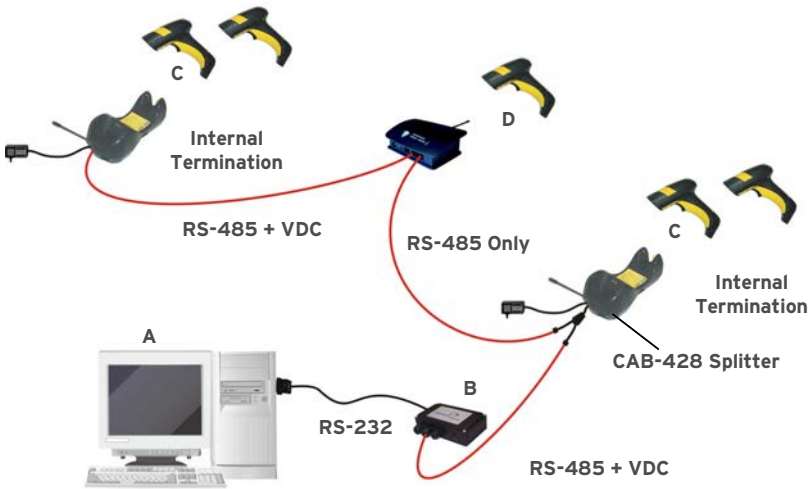
In this layout the BC-80X0 cradle is connected by a dedicated cable using the RS-232 interface to a C-BOX connection box as part of a fixed scanner network. This allows the flexibility of a hand-held reading station integrated into a variety of fixed scanning applications so that all readers (both fixed and hand-held), in the system provide communications to the Host.

The various C-BOX models provide many interface types for the Host system such as RS-232, RS-485, or Profibus.

3.2 MULTIDROP STAR-SYSTEM™ NETWORK LAYOUTS

Even though many stand-alone systems can operate in the same physical area without interfering with each other, it may be desirable to bridge data from multiple base stations in a network to a single Host. PowerScan™ M8300 readers are compatible with STAR-System™ networks. These networks provide seamless active roaming for any RF reading device in the system.

3.2.1 Host Master Layout



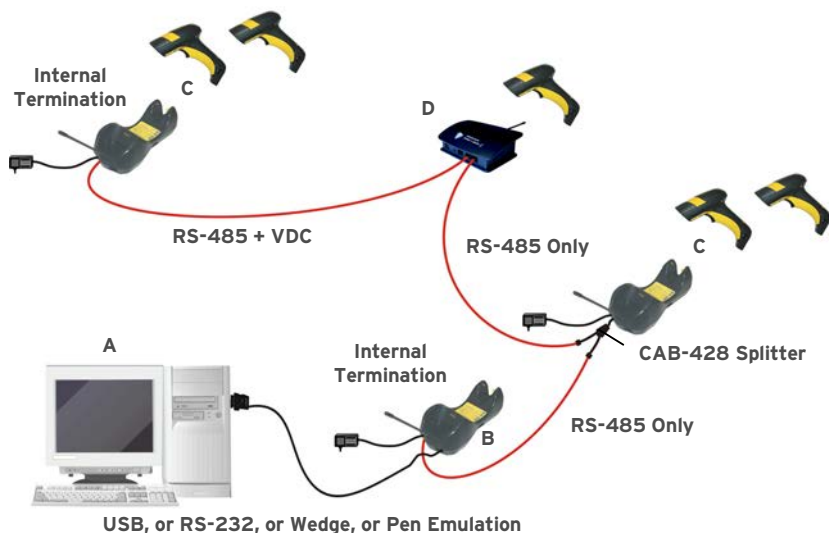
- A. Host Master with STAR-Link™
- B. STAR-Box™ converter
- C. BC-8060 slave cradles
- D. STARGATE™ base stations

Example: Multidrop STAR-System™ Network with Host as Master

In this layout the Host acts as the Master using STAR-Link™ software. The Host is connected in RS-232 to a STAR-Box™ converter, which is connected to the first slave in the RS-485 network. In this way the base stations provide communications between a single Host and all readers in the system. STARGATE™ base stations are used as Slaves in this network. The Slaves at the ends of the network must be terminated (see the STARGATE™ and STAR-Box™ Installation Manuals and section 2.8.3).

See "Powerscan™ M8300/Star-System™ Setup" and "BC-8060 Star-System™ Network Setup" (sections 4.6 and 4.7), or the original manufacturer's Datalogic Aladdin™ Help On-Line, for system configuration specifications.

3.2.2 BC-8060 Master Layout



- A. Host
- B. BC-8060 Master cradle
- C. BC-8060 Slave cradles
- D. STARGATE™ base station

Example: Multidrop STAR-System™ Network with BC-8060 as Master

In this layout a BC-8060 cradle acts as the Master. The Host is connected to the BC-8060 Master using any one of the multi-standard interfaces (RS-232, USB, WEDGE, or PEN Emulation). The Master is then connected to the slaves in the RS-485 network. In this way the slave cradles provide communications between a single Host and all readers in the system. STARGATE™ base stations can also be used as slaves in this network. The devices at the ends of the network must be terminated (see section 2.8.3).

See "Powerscan™ M8300/Star-System™ Setup" and "BC-8060 Star-System™ Network Setup" (sections 4.6 and 4.7), or the original manufacturer's Datalogic Aladdin™ Help On-Line, for system configuration specifications.

3.2.3 Master BC-8060 Network Troubleshooting

Two diagnostic strings can be sent via RS-232 from the Host to the Master cradle in order to have feedback about the network itself.

#+LSlave

Returns a list of all the Slaves recognized at boot up.

Example:

In a network where the Master cradle has address **0188** and one Slave cradle with address **0001**, the response is:

```
188
1
```

#+Alive<xxxx>

Executes a continuous Alive request to the slave xxxx in order to monitor the performance of the connection. A diagnostic message is displayed on the Host.

Example:

If this command is sent for slave cradle with address **0032**, the response is:

```
/*32: BC-80X0 SOFTWARE RELEASE 1.00 20/10/2006*/
if there are no communication errors
```

```
/*32: FAIL*/
```

if there are communication errors.

To exit from this command, reset the system by cycling power to the Master cradle.

4 CONFIGURATION

4.1 CONFIGURATION METHODS

4.1.1 Reading Configuration Barcodes

This manual can be used for complete setup and configuration of your reader by following the setup procedures in this chapter (see section 4.2 for an overview).

If you wish to change the default settings, this manual provides complete configuration of your reader in an easy way.

To configure your reader:

Print [Appendix C](#) with the hex-numeric table and keep it open during the device configuration.

Read the **Enter Configuration** code [ONCE](#), available at the top of each page of configuration.

Modify the desired parameters in one or more sections following the procedures given for each group.

Read the **Exit and Save Configuration** code [ONCE](#), available at the top of each page of configuration.

Reference notes describing the operation of the more complex parameters are given in the References section.

4.1.2 Using the Original Manufacturer's Datalogic Aladdin™

The original manufacturer's Datalogic Aladdin™ is a multi-platform utility program providing a quick and user-friendly configuration method via the RS-232/USB-COM interface.

It also allows upgrading the software of the connected device (see the original manufacturer's Datalogic Aladdin™ Help On-Line for more details).

4.1.3 Copy Command

A previously configured device (Master), can be used to send its configuration directly to other devices of the same type (Slaves). The particular procedure for each device is given in section 5.14.

4.1.4 Sending Configuration Strings from Host

An alternative configuration method is provided in Appendix A using the RS-232 interface. This method is particularly useful when many devices need to be configured with the same settings. Batch files containing the desired parameter settings can be prepared to configure devices quickly and easily.

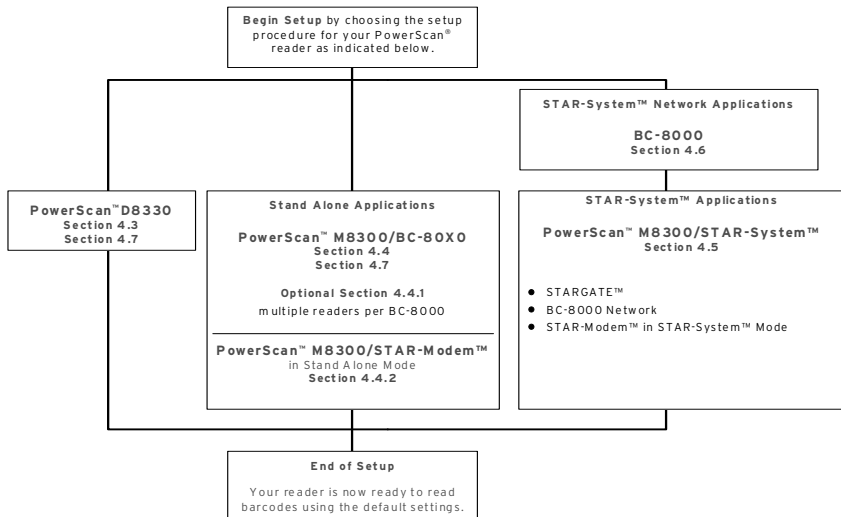
4.2 SETUP PROCEDURES

For PowerScan™ D8330 Series readers, follow the setup procedures in sections 4.3, and 4.8.

For PowerScan™ M8300 Series readers, the setup procedures depend on two basic applications, Stand-alone or STAR-System™.

- Stand-alone applications allow communication with the Host by either the BC-80X0 cradle (section 4.5), or by the STAR-Modem™ radio modem (section 4.5.2).
- STAR-System™ applications allow communication with the Host through a RS-485 network by the STARGATE™ RF base station or by the BC-8000 cradle (sections 4.6 and 4.7).

Proceed as shown in the following diagram:



4.3 POWERSCAN™ D8330 SETUP

1. Read the restore default parameters code below.

Restore PowerScan™ D8330 Default



After reading the above code, go to section 4.8, Interface Selection.

4.4 POWERSCAN™ M8300/BC-80X0 POINT-TO-POINT SETUP

A rapid configuration procedure has been devised for point-to-point applications where a single reader is associated exclusively with its own BC-80x0 base station and where it is not necessary to set the Date and Time parameters.

A special pre-printed bind-address label provided in the BC-80x0 base station package can be used to bind the PowerScan™ M8300 reader to the base station with the address coded on the label. The address is also written numerically on the label to be easily recognized. Valid addresses are in the range from 0000 to 1999. **Make sure that all cradles used in the same area have different addresses.**

To rapidly configure your point-to-point application:

1. Apply the bind-address label onto the BC-80x0 base station as indicated in the BC-80x0 Quick Reference Guide.
2. When the BC-80X0 cradle is connected and powered, read the **Bind-Address** label to pair the PowerScan™ M8300 to the BC-80X0 cradle. The green LED on the PowerScan™ M8300 will blink: the reader is ready to be positioned onto the cradle.
3. Firmly position the reader onto the cradle within 10 seconds, a beep will be emitted, signaling that the BC-80X0 cradle has been paired to the PowerScan™ M8300, and the green LED on the reader will go off.

Green LED



If it ever becomes necessary to change the reader, just read the bind-address label applied to the cradle and position the new reader onto the cradle.

Do not use multiple readers with this configuration method.

4. Configure the BC-80X0 cradle, refer to the BC-80X0 Quick Reference Guide.

END of procedure. YOUR READER IS NOW READY TO READ CODES.

4.5 POWERSCAN™ M8300/BC-80X0 STAND-ALONE SETUP

Read the restore default parameters code below.

1. Restore PowerScan™ M8300 Default



Follow the procedure below to set the radio address and bind PowerScan™ M8300 to the BC-80X0 cradle.

2. Enter Configuration



3. Set Date



+

six digits for Day, Month and Year (DDMMYY)

4. Set Time



+

four digits for Hour and Minutes (HHMM)

5. Set Radio Address



+

four digits for the PowerScan™ M8300 Address (from 0000 to 1999).

**ALL READERS USED IN THE SAME AREA
MUST HAVE DIFFERENT ADDRESSES.**

6. Exit and Save Configuration



7. Read the **Bind** code to pair the PowerScan™ M8300 to the BC-80X0 cradle. The reader is dedicated to the cradle. Any previously **bound** reader will be excluded.

To connect several readers to the same cradle see the following paragraph 4.5.1, 'Using Multiple M8300 Series Readers with Same Cradle'.

Bind



The green LED on the PowerScan™ M8300 will blink; the reader is ready to be inserted into the cradle.

8. Firmly insert the reader into the BC-80X0 cradle within 10 seconds, a beep will be emitted, signaling that the BC-80X0 cradle has been paired to the PowerScan™ M8300, and the green LED on the reader will go off.



9. **Read the BC-80X0 restore default code:**

Restore BC-80X0 Default



Go to section 4.8, Interface Selection.

4.5.1 Using Multiple M-Series Readers with the Same Cradle

If you want to use several M-Series readers with the same BC-80X0 cradle, you must first **Bind** the cradle with one of the readers (see previously described configuration procedure).

Successive readers can be associated with the same cradle by following the configuration procedure substituting the **Bind** command with **Join** (step 7).

7.



The green LED on the PowerScan™ M8300 will blink: the reader is ready to be positioned onto the cradle. Complete step 8.

END of procedure.



CAUTION

All readers associated with the same cradle must have different addresses.

YOUR READER IS NOW READY TO READ BARCODES.

To change the defaults see section 4.10.

4.5.2 PowerScan™ M8300/STAR-Modem™ in Stand-Alone Mode

To configure a PowerScan™ M8300 reader to communicate with STAR-Modem™ in Stand-alone Mode, follow the procedure in section 4.5, substituting steps 6 and 7 with those below:

6.

STAR-Modem™ Address



Read the code above and the four-digit address of the STAR-Modem™.

7.

Exit and Save configuration




END of procedure.


YOUR READER IS NOW READY TO READ BARCODES.


To change the defaults see section 4.10.


4.6 POWERSCAN™ M8300/STAR-SYSTEM™ SETUP


The following procedure allows configuring a PowerScan™ M8300 reader to communicate with various STAR-System™ devices such as STARGATE™ RF base stations.


1. Restore PowerScan™ M8300 Default


2. Enter Configuration


3. Set Date

 +
 six digits for Day, Month and Year (DDMMYY)

4. Set Time

 +
 four digits for Hour and Minutes (HHMM)

5. Set the connection according to the length of the codes to be read:
 Code Length ≤240 Characters


 Code Length >240 Characters
 (not for systems with BC-8000 as Master)


6.

Set Radio Address



+

four digits from the Numeric Table in the range 0000-1999.

ALL READERS MUST HAVE DIFFERENT ADDRESSES.

7.

First STAR-System™ Address



Read the code above and the four-digit address of the First STAR-System™ device in the system.

8.

Set Last STAR-System™ Address



Read the code above and the four-digit address of the Last STAR-System™ device in the system.



NOTE

Whenever the system is composed of a single base station, the first and last base station addresses (steps 7 and 8) must have the same value.

9.

Exit and Save Configuration



END of procedure.

YOUR READER IS NOW READY TO READ BARCODES.

To change the defaults see section 4.10.

4.7 BC-8060 STAR-SYSTEM™ NETWORK SETUP

When the BC-8060 cradle model is used in an RS-485 network, it must be initially configured. To do this using configuration barcodes, follow the procedure below using any PowerScan™ M8300 reader.

1. Set BC-8060 Address



+

four digits for the BC-8060 Address (from **0000** to **1999**).

All cradles used in the network must have different addresses.

2. Exit and Save configuration



3. Read the **Bind** code to pair the PowerScan™ M8300 to the BC-8060 cradle for configuration.

Bind



The green LED on the PowerScan™ M8300 will blink; the reader is ready to be inserted into the cradle.

4. Firmly insert the reader into the BC-8060 cradle within 10 seconds. A beep will be emitted, signaling that the BC-8060 cradle has been paired to the PowerScan™ M8300, and the green LED on the reader will go off.

Green LED



5. **Read the BC-8060 restore default code:**

Restore BC-8060 Default



6. **Read the desired Enable Network code.**

Enable RS-485 Master



Enable RS-485 Slave



END of procedure.

For **Host Master Network Layouts** (see section 3.2), The network configuration parameters can be changed through STAR-Link™ software running on the PC. Star-Link™ software can be downloaded free from the original manufacturer's web site: www.scanning.datalogic.com.

For **BC-8060 Master Network Layouts** (see section 3.2), The network configuration parameters can be changed either through the original manufacturer's Datalogic Aladdin™ configuration software running on the PC or by reading the barcode selections in the Network section of this manual starting on page 63. If using configuration barcodes, it is advised to completely configure the cradles before reconfiguring the PowerScan™ M8300 reader (see below).



NOTE

After completing the BC-8060 cradle configuration and connections in the network, you must reconfigure the PowerScan™ M8300 reader using the STAR-System™ procedure in section 4.6.

4.8 INTERFACE SELECTION

Read the interface selection code for your application.

RS-232

Standard



POS TERMINALS

Nixdorf Mode A



Fujitsu



ICL Mode



For POS terminal default settings refer to section 5.15.

PEN



WEDGE

IBM AT or PS/2 PCs



IBM XT



PC Notebook



IBM SURE1



IBM Terminal 3153



IBM Terminals 31xx, 32xx, 34xx, 37xx:

To select the interface for these IBM Terminals, read the correct KEY TRANSMISSION code. Select the KEYBOARD TYPE if necessary (default = advanced keyboard).

KEY TRANSMISSION MODE

make-only keyboard



make-break keyboard



KEYBOARD TYPE

◆ advanced keyboard



typewriter keyboard



WEDGE (CONTINUED)

ALT MODE

The ALT-mode selection allows barcodes sent to the PC to be interpreted correctly independently from the Keyboard Nationality used. **You do not need to make a Keyboard Nationality selection.**

(default = Num Lock Unchanged).

Make sure the Num Lock key on your keyboard is ON.

IBM AT - ALT mode



PC Notebook - ALT mode



WYSE TERMINALS

ANSI Keyboard



PC Keyboard



ASCII Keyboard



VT220 style Keyboard



DIGITAL TERMINALS

VT2xx/VT3xx/VT4xx



4.9 USB READER CONFIGURATION

The USB interface is available for PowerScan™ D8330, BC-80x0 and C-8000 devices and is compatible with the following Operating Systems:

Windows 98 (and later)
Mac OS 8.0 (and later)

IBM POS for Windows
4690 Operating System

USB Start-up

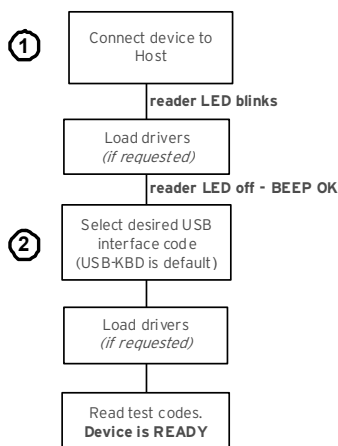
As with all USB devices, upon connection, the Host performs several checks by communicating with the device. During this phase normal operations are suspended (the LED on the PowerScan™ D8330 reader blinks). Two basic conditions must be met before the device is ready, the correct USB driver must be loaded and sufficient power must be supplied to the reader.

① For all systems, the correct USB driver for the default USB-KBD interface is included in the Host Operating System and will either be loaded automatically or will be suggested by the O.S. and should therefore be selected from the dialog box (the first time only).

Normally the Host supplies sufficient power to the device and the start-up phase ends correctly. (The reader's LED stops blinking and the reader emits the beep OK signal).

In rare cases, if the Host does not supply sufficient power to the device, a dialog box will appear on the Host and the device will be blocked (the reader's LED continues blinking). In this case, disconnect the USB device cable at the Host (the reader's LED stops blinking), and then try a different USB port as indicated by the Operating System message. (The device emits the beep OK signal. You can now read codes).

First Start-Up



② At this point you can read the USB interface configuration code according to your application. Load drivers from the O.S. (if requested). When configuring the USB-COM interface, the relevant files and drivers must be installed from the USB Device Installation software, which can be downloaded from the original manufacturer's web page at <http://www.scanning.datalogic.com>.

The device is ready. Successive start-ups will automatically recognize the previously loaded drivers.

USB

USB-KBD



USB-KBD-ALT-MODE



USB-KBD-APPLE



USB-COM*



USB-IBM-Table Top



USB-IBM-Hand Held



*When configuring USB-COM, the relevant files and drivers must be installed from the USB Device Installation software, which can be downloaded from the original manufacturer's web site at <http://www.scanning.datalogic.com>.

4.10 CHANGING DEFAULT SETTINGS

Once your reader is setup, you can change the default parameters to meet your application needs. Refer to the preceding paragraphs for initial configuration in order to set the default values and select the interface for your application.

In this manual, the configuration parameters are divided into logical groups making it easy to find the desired function based on its reference group.

The first four groups are for Standard Interface parameter configuration for all PowerScan™ D8330 series readers and PowerScan™ M8300/BC-80X0 Stand-alone configurations only:

RS-232

USB

WEDGE

PEN EMULATION

NETWORK PARAMETERS are available only for BC-8060 Network configurations.

The following parameter groups are common to all interface applications:

DATA FORMAT parameters regard the messages sent to the Host system for all interfaces except Pen Emulation.

POWER SAVE manages overall current consumption in the reading device.

READING PARAMETERS control various operating modes and indicator status functioning.

DECODING PARAMETERS maintain correct barcode decoding in certain special reading conditions.

CODE SELECTION parameters allow configuration of a personalized mix of codes, code families and their options.

ADVANCED FORMATTING PARAMETERS allow code concatenation and advanced formatting of messages towards the Host. It cannot be used with Pen Emulation connections.

RADIO PARAMETERS (M8300 series only) allow configuration of radio control parameters.

DISPLAY PARAMETERS (some M8300 series models only) allow configuration of reader display parameters.

RS-232 PARAMETERS

All PowerScan™ D8330 Series readers
+
PowerScan™ M8300/BC-80X0 configurations only

⊙	Baud Rate	⊙
⊙	Parity	⊙
⊙	Data Bits	⊙
⊙	Stop Bits	⊙
⊙	Handshaking	⊙
⊙	ACK/NACK Protocol	⊙
⊙	FIFO	⊙
⊙	Inter-character Delay	⊙
⊙	RX Timeout	⊙
⊙	Serial Trigger Lock	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.
2. Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.



BAUD RATE

300 baud



600 baud



1200 baud



2400 baud



4800 baud



◆ 9600 baud



19200 baud



38400 baud



PARITY

◆ none



even parity



odd parity



Enter Configuration



RS-232

Exit and Save



DATA BITS

7 bits



◆ 8 bits



9 bits



STOP BITS

◆ 1 stop bit



2 stop bits



HANDSHAKING

◆ disable



hardware (RTS/CTS)



software (XON/XOFF)



RTS always ON



See section 5.1.1 for details.



ACK/NACK PROTOCOL

◆ disable



enable



See section 5.1.2 for details, particularly on implementing this parameter with PowerScan™ M8300.

FIFO

disable



◆ enable



See section 5.1.3 for details.

INTER-CHARACTER DELAY

delay between characters transmitted to Host



Read 2 numbers from the table where:

00 = DELAY disabled

01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled



RX TIMEOUT

timeout control in reception from Host



Read 2 numbers from the table where:

00 = TIMEOUT disabled

01-99 = TIMEOUT from .1 to **9.9** seconds

◆ rx timeout 5 seconds

See section 5.1.4 for details.

SERIAL TRIGGER LOCK

◆ disabled



enable and select characters



Read 2 characters from the Hex/Numeric table in the range 00-FE where:

- First Character enables device trigger
- Second Character inhibits device trigger until the first character is received again.

USB PARAMETERS

⊙	USB-COM Handshaking, Ack/Nack protocol, FIFO, Inter-character delay, Rx timeout, Serial trigger lock	⊙
⊙	USB-KBD Keyboard nationality, FIFO, Inter-character delay, Inter-code delay, USB keyboard speed	⊙
⊙	USB-IBM No parameter selection required.	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.



HANDSHAKING

◆ disable



hardware (RTS/CTS)



software (XON/XOFF)



RTS always ON



See section 5.1.1 for details.

ACK/NACK PROTOCOL

◆ disable



enable



See section 5.1.2 for details, particularly on implementing this parameter with PowerScan™ M8300.

FIFO

disable



◆ enable



See section 5.1.3 for details.



INTER-CHARACTER DELAY



delay between characters transmitted to Host



Read 2 numbers from the table where:

00 = DELAY disabled

01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled

RX TIMEOUT



timeout control in reception from Host



Read 2 numbers from the table where:

00 = TIMEOUT disabled

01-99 = TIMEOUT from .1 to 9.9 seconds

◆ rx timeout 5 seconds

See section 5.1.4 for details.

SERIAL TRIGGER LOCK

◆ disabled



enable and select characters



Read 2 characters from the Hex/Numeric table in the range 00-FE where:

- First Character enables device trigger
- Second Character inhibits device trigger until the first character is received again.



KEYBOARD NATIONALITY**Not Available for USB-KBD-ALT-MODE Interface**

This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian



English (UK)



French



German



Italian



Spanish



Swedish



◆ USA



Enter Configuration



USB-KBD

Exit and Save



The Japanese and Eastern Block Keyboard Nationality selections are valid only for IBM AT compatible PCs.

Japanese



Russian (Latin)



Russian (Cyrillic)



Hungarian



Slovenian, Croatian, Serbian
(Latin)



Romanian



Czech Republic



FIFO

disable



◆ enable



See section 5.1.3 for details.



INTER-CHARACTER DELAY



delay between characters transmitted to Host



Read 2 numbers from the table where:

00 = DELAY disabled

01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled

INTER-CODE DELAY



delay between codes transmitted to Host



Read 2 numbers from the table where:

00 = DELAY disabled

01-99 = DELAY from 1 to 99 seconds

◆ delay disabled

USB KEYBOARD SPEED

◆ Normal



Fast



WEDGE PARAMETERS

All PowerScan™ D8330 Series readers
+
PowerScan™ M8300/BC-80X0 configurations only

⊙	Keyboard Nationality	⊙
⊙	Caps Lock	⊙
⊙	Caps Lock	⊙
⊙	Auto-recognition	⊙
⊙	Num Lock	⊙
⊙	Inter-character Delay	⊙
⊙	Inter-code Delay	⊙
⊙	Keyboard Setting	⊙
⊙	Wedge Control Character	⊙
	Emulation	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

Enter Configuration



WEDGE

Exit and Save



KEYBOARD NATIONALITY

Belgian



English (UK)



French



German



Italian



Spanish



Swedish



◆ USA



Enter Configuration



WEDGE

Exit and Save



The Japanese and Eastern Block Keyboard Nationality selections are valid only for IBM AT compatible PCs.

Japanese



Russian (Latin)



Russian (Cyrillic)



Hungarian



Slovenian, Croatian, Serbian
(Latin)



Romanian



Czech Republic



CAPS LOCK

◆ caps lock OFF



caps lock ON



Select the appropriate code to match your keyboard caps lock status.

NOTE: Caps lock manual configuration is ignored when Caps Lock Auto-Recognition is enabled.

For **PC Notebook** interface selections, the caps lock status is automatically recognized; therefore this command is not necessary.



CAPS LOCK AUTO-RECOGNITION (IBM AT COMPATIBLE ONLY)

disable



◆ enable



NUM LOCK

toggle num lock



◆ num lock unchanged



This selection is used together with the Alt Mode interface selection for AT or Notebook PCs.

It changes the way the Alt Mode procedure is executed; therefore it should be set as follows:

- if your keyboard Num Lock is normally on use **num lock unchanged**
- if your keyboard Num Lock is normally off use **toggle num lock**

In this way the device will execute the Alt Mode procedure correctly for your application.

INTER-CHARACTER DELAY

delay between characters transmitted to Host

**Read 2 numbers from the table where:**

00 = DELAY disabled

01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled



INTER-CODE DELAY

delay between codes transmitted to Host

**Read 2 numbers from the table where:**

00 = DELAY disabled

01-99 = DELAY from 1 to 99 seconds

◆ delay disabled

KEYBOARD SETTING**ALPHANUMERIC KEYBOARD SETTING**

The device (reader or cradle) can be used with terminals or PCs with various keyboard types and nationalities through a simple keyboard setting procedure.

The type of computer or terminal must be selected before activating the keyboard setting command.

Keyboard setting consists of communicating to the device how to send data corresponding to the keyboard used in the application. The keys must be set in a specific order.

Press and release a key to set it.

Some characters may require more than one key pressed simultaneously during normal use (refer to the manual of your PC or terminal for keyboard use). The exact sequence must be indicated to the reader in this case pressing and releasing the different keys.

Example:

If one has to press the "Shift" and "4" keys simultaneously on the keyboard to transmit the character "\$" to the video, to set the "\$", press and release "Shift" then press and release "4".

Each pressed and released key must generate an acoustic signal on the device; otherwise repress the key. Never press more than one key at the same time, even if this corresponds to the normal use of your keyboard.

Press "Backspace" to correct a wrong key entry. In this case the device emits 2 beeps.

NOTE: "CAPS LOCK" and "NUM LOCK" must be off before starting the keyboard setting procedure. "SHIFT" must be repressed for each character and cannot be substituted by "CAPS LOCK".



setting the alphanumeric keyboard



Read the code above.

Press the keys shown in the following table according to their numerical order.



Some ASCII characters may be missing, depending on the keyboard type. These are generally particular characters relative to the various national symbologies. In this case:

- The first 4 characters (Shift, Alt, Ctrl, and Backspace) can only be substituted with keys not used, or substituted with each other.
- Characters can be substituted with other single symbols (e.g. "SPACE") even if not included in the barcode set used.
- Characters can be substituted with others corresponding to your keyboard.

The device signals with 2 beeps to indicate the keys have been registered.



Do not place the reader onto the BC-80X0 cradle during this procedure. Otherwise, battery charging will occur, modifying the LEDS' functioning.

01: Shift	26: 5	51: N
02: Alt	27: 6	52: O
03: Ctrl	28: 7	53: P
04: Backspace	29: 8	54: Q
05: SPACE	30: 9	55: R
06: !	31: :	56: S
07: "	32: ;	57: T
08: #	33: <	58: U
09: \$	34: =	59: V
10: %	35: >	60: W
11: &	36: ?	61: X
12: '	37: @	62: Y
13: (	38: A	63: Z
14:)	39: B	64: [
15: *	40: C	65: \
16: +	41: D	66:]
17: ,	42: E	67: ^
18: -	43: F	68: _ (underscore)
19: .	44: G	69: `
20: /	45: H	70: {
21: O	46: I	71: |
22: 1	47: J	72: }
23: 2	48: K	73: ~
24: 3	49: L	74: DEL
25: 4	50: M	

CONTROL CHARACTER EMULATION

◆ Ctrl + Shift + Key



Ctrl + Key



PEN EMULATION

<p>All PowerScan™ D8330 Series readers + PowerScan™ M8300/BC-80X0 configurations only</p>

⊙	Operating Mode	⊙
⊙	Minimum Output Pulse	⊙
⊙	Conversion to Code 39	⊙
⊙	Overflow	⊙
⊙	Output Level	⊙
⊙	Idle Level	⊙
⊙	Inter-Block Delay	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.
2. Read configuration codes from the desired groups.

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

PEN EMULATION

The following operating mode parameters are complete commands and do not require reading the Enter and Exit configuration codes.

OPERATING MODE

◆ interpret mode



Interprets commands without sending them to the decoder.

transparent mode



Sends commands to the decoder without interpreting them.



MINIMUM OUTPUT PULSE



See section 5.2.1 for details.

Enter Configuration



PEN EMULATION

Exit and Save Configuration



CONVERSION TO CODE 39 (D8330 SERIES ONLY)

- ◆ disable conversion to Code 39



Transmits codes in their original format.

- enable conversion to Code 39



Converts codes read into Code 39 format.

See section 5.2.2 for details.

CONVERSION TO CODE 39 AND CODE 128 (M8300 SERIES ONLY)

- ◆ enable conversion to Code 39



Converts codes read into Code 39 format.

- enable conversion to Code 128



Converts codes read into Code 128 format.

See section 5.2.2 for details.

OVERFLOW

narrow



wide



- ◆ medium



See section 5.2.3 for details.

***OUTPUT LEVEL***

◆ normal



(white = logic level 0)

inverted



(white = logic level 1)

See section 5.2.4 for details.

IDLE LEVEL

◆ normal



(black level)

inverted



(white level)

See section 5.2.4 for details.

INTER-BLOCK DELAY

delay between character blocks transmitted to Host



Read 2 numbers from the table where:

00 = DELAY disabled

01-99 = DELAY from .1 to 9.9 seconds

◆ delay disabled

See section 5.2.5 for details.

NETWORK PARAMETERS

BC-8060 model configurations only

⊙	RS-485 Network	⊙
⊙	Network Baud Rate	⊙
⊙	Slave Address Range	⊙
⊙	Network Warning Message	⊙
⊙	Reception Warning Message	⊙
⊙	Master Cradle Header	⊙
⊙	Master Cradle Terminator	⊙

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.



RS-485 NETWORK

- ◆ disable RS-485 network



enable RS-485 slave



enable RS-485 master



See section 3.2 for details.

**NOTE**

If a BC-8060 cradle is errantly configured as a Slave but not connected to a network, it may not be able to receive further commands from the reader. In this case it can be reconfigured by executing the bind procedure, which returns the cradle to Stand-alone configuration.

NETWORK BAUD RATE

9600



19200



- ◆ 38400



**SLAVE ADDRESS RANGE**

First Address



Read the code above and the four-digit address of the First Slave device in the system.



Last Address



Read the code above and the four-digit address of the Last Slave device in the system.

See section 5.3.1 for details.

NETWORK WARNING MESSAGE

◆ network warning
message not transmitted



network warning message
transmitted



See section 5.3.2 for details.

RECEPTION WARNING MESSAGE

reception warning message
not transmitted



◆ reception warning
message transmitted



See section 5.3.3 for details.



MASTER CRADLE HEADER

◆ no header



one character header



two character header



three character header



four character header



five character header



six character header



seven character header



eight character header



After selecting **one** of the desired Header codes, read the character(s) from the HEX table.

Valid characters are in the range: **00-FE**

Example:

+ 41 + 42 + 43 + 44 = Header **ABCD**

For more details about default and WEDGE Interface Extended Keyboard values, see sections 5.3.4, 5.4.1 and 5.4.2.



MASTER CRADLE TERMINATOR

◆ no terminator



one character terminator



two character terminator



three character terminator



four character terminator



five character terminator



six character terminator



seven character terminator



eight character terminator



After selecting **one** of the desired Terminator codes, read the character(s) from the HEX table.

Valid characters are in the range: **00-FE**

Example:

two character terminator



+ **0D** + **0A** = Terminator **CR LF**

For more details about default and WEDGE Interface Extended Keyboard values, see sections 5.3.4, 5.4.1 and 5.4.2.

DATA FORMAT

NOT FOR PEN INTERFACES

⦿	Code Identifier	⦿
⦿	Custom Code Identifier	⦿
⦿	Header	⦿
⦿	Terminator	⦿
⦿	Special Keys	⦿
⦿	Field Adjustment	⦿
⦿	Field Adj. Character	⦿
⦿	Code Length Tx	⦿
⦿	Character Replacement	⦿
⦿	Address Stamping	⦿
⦿	Address Delimiter	⦿
⦿	Time Stamping	⦿
⦿	Time Delimiter	⦿

Read the Enter **Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

DATA FORMAT

CODE IDENTIFIER TABLE			
CODE	AIM STANDARD	MANUFACTURER STANDARD	Custo m
2/5 interleaved	11 y	N	
2/5 industrial	1 X y	P	
2/5 normal 5 bars	1 S y	O	
2/5 matrix 3 bars	1 X y	Q	
EAN 8	1 E 4	A	
EAN 13	1 E 0	B	
UPC A	1 X y	C	
UPC E	1 X y	D	
EAN 8 with 2 ADD ON	1 E 5	J	
EAN 8 with 5 ADD ON	1 E 6	K	
EAN 13 with 2 ADD ON	1 E 1	L	
EAN 13 with 5 ADD ON	1 E 2	M	
UPC A with 2 ADD ON	1 X y	F	
UPC A with 5 ADD ON	1 X y	G	
UPC E with 2 ADD ON	1 X y	H	
UPC E with 5 ADD ON	1 X y	I	
Code 39	1 A y	V	
Code 39 Full ASCII	1 A y	W	
CODABAR	1 F y	R	
ABC CODABAR	1 X y	S	
Code 128	1 C y	T	
EAN 128	1 C y	k	
ISBT 128	1 C 4	f	
Code 93	1 G y	U	
CIP/39	1 X y	Y	
CIP/HR	1 X y	e	
Code 32	1 X y	X	
MSI	1 M y	Z	
Code 11	1 H y	b	
Code 16K	1 K 0	p	
Code 49	1 T y	q	
GSI DataBar™ Expanded Linear and Stacked	1 e 0	t	
GSI DataBar Limited	1 e 0	v	
GSI DataBar 14 Linear and Stacked	1 e 0	u	

- AIM standard identifiers are not defined for all codes; the X identifier is assigned to the code for which the standard is not defined. The y value depends on the selected options (check digit tested or not, check digit tx or not, etc.).
- When customizing the Manufacturer Standard code identifiers, 1 or 2 identifier characters can be defined for each code type. If only 1 identifier character is required, the second character must be selected as **FF** (disabled).
- The code identifier can be singly disabled for any code by simply selecting **FF** as the first identifier character.
- Write in the Custom character identifiers in the table above for your records.



CODE IDENTIFIER

◆ disable



Manufacturer standard



AIM standard



custom



CUSTOM CODE IDENTIFIER

define custom code identifier(s)



- ① Read the above code.
(Code Identifiers default to Manufacturer standard, see the table on previous page).
- ② Select the code type from the code table in Appendix B for the identifier you want to change.
- ③ You can define 1 or 2 identifier characters for each code type. If only 1 identifier character is required, the second character must be selected as **FF** (disabled). Read the hexadecimal value corresponding to the character(s) you want to define as identifiers for the code selected in step ②: valid characters are in the range **00-FD**.

Example: To define Code 39 Code Identifier = @

Read define custom code identifier(s) + Code 39 + 40 + FF






HEADER

no header



one character header



two character header



three character header



four character header



five character header



six character header



seven character header



eight character header



After selecting **one** of the desired Header codes, read the character(s) from the HEX table. Valid characters are in the range **00-FE**. For Wedge and USB-KBD interfaces, it is also possible to read the **Special Key(s)** on page 73.

Example:
 $+ 41 + 42 + 43 + 44 = \text{Header } \mathbf{ABCD}$

For more details see sections 5.4.1 and 5.4.2.



TERMINATOR

no terminator



one character terminator



two character terminator



three character terminator



four character terminator



five character terminator



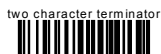
six character terminator



seven character terminator

eight character
terminator

After selecting **one** of the desired Header codes, read the character(s) from the HEX table. Valid characters are in the range **00-FE**. For Wedge and USB-KBD interfaces, it is also possible to read the **Special Key(s)** on page 73.

Example:+ **0D** + **0A** = Terminator **CR LF**

For more details see sections 5.4.1 and 5.4.2.



SPECIAL KEYS

Available only for Wedge IBM AT-PS/2 and USB-KBD Interfaces

**NOTE**

It is necessary to define each Special Key by following the procedure given in section 5.4.2.

Select one or more of the following Special Keys according to your needs.

Special Key 1



Special Key 2



Special Key 3



Special Key 4



Special Key 5



**FIELD ADJUSTMENT**

◆ disable field adjustment



Field adjustment allows a number of characters n , to be added to or subtracted from the barcode read. The adjustment can be different for each enabled code type. To define the field adjustment:

① Read the enable field adjustment code:



enable field adjustment



② Select the code type from the Code Identifier Table in Appendix B.

③ Select the type of adjustment to perform:

right addition



left addition



right deletion



left deletion



④ Read a number in the range **01 - 32** from the Hex/Numeric Table to define how many characters to add or delete:

Conditions:

- Adjustment is only performed on the barcode data, the Code Identifier and Code Length Transmission fields are not modified by the field adjustment parameter.
- If the field setting would subtract more characters than exist in the barcode, the subtraction will take place only to code length 0.
- You can set up to a maximum of 10 different field adjustments on the same barcode family or on different barcode families.

Example: To add 4 characters to the right of Standard Code 39 Codes:

Read  +  +  + 04



FIELD ADJUSTMENT CHARACTER

- ① Read the field adjustment character code:



- ② Read the hexadecimal value corresponding to the character you want to use for field adjustment. Valid characters are in the range **00-FE**. For Wedge and USB-KBD interfaces, it is also possible to read the **Special Key(s)** on page 73.

Example:

To define the field adjustment character = **A**:



CODE LENGTH TX

◆ code length not transmitted



code length transmitted in variable-digit format



code length transmitted in fixed 4-digit format



The code length is transmitted in the message after the Headers and Code Identifier characters. The code length is calculated after performing any field adjustment operations.



CHARACTER REPLACEMENT

◆ disable character replacement



This parameter allows up to three characters to be replaced from the barcode read. These substitutions are stored in memory. To define each character replacement:

- ① Read one of the following character replacement codes:

first character replacement



second character replacement



third character replacement



- ② From the Code Identifier Table in Appendix B, read the Code Identifier for the desired code family.

0 = character replacement will be effective for all code families.

- ③ From the Hex/Numeric Table read two characters corresponding to the Hex value (00-FE), which identifies the character to be replaced. For Wedge and USB-KBD interfaces, it is also possible to read the **Special Key(s)** on page 73.

- ④ From the Hex/Numeric Table read two characters corresponding to the Hex value (00-FE), which identifies the new character to replace. For Wedge and USB-KBD interfaces, it is also possible to read the **Special Key(s)** on page 73.

FF = the character to be replaced will be substituted with no character, that is, it will be removed from the code.

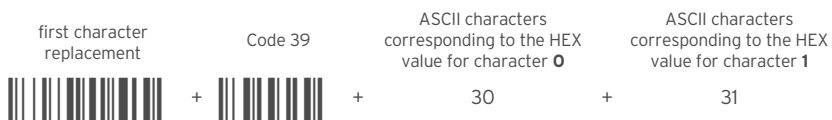


DATA FORMAT

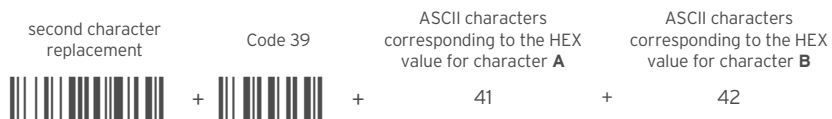
**Example:**

The following strings define:

1. *First Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **O** character with the **1** character.
2. *Second Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **A** character with the **B** character.



For Code 39 codes containing the string "**O123**", the contents transmitted will be "**1123**".



For Code 39 codes containing the string "**ABCD**", the contents transmitted will be "**BBCD**".



ADDRESS STAMPING (M8300 SERIES ONLY)

◆ disable reader address stamping



enable reader address stamping



◆ disable cradle address stamping



enable cradle address stamping



See section 5.4.3 for details.

ADDRESS DELIMITER (M8300 SERIES ONLY)

◆ disable reader address delimiter

enable reader address delimiter and
select characters

◆ disable cradle address delimiter

enable cradle address delimiter and
select charactersRead 2 HEX characters in the range **00-FE**.Read 2 HEX characters in the range **00-FE**.

See section 5.4.4 for details.



TIME STAMPING (M8300 SERIES ONLY)

◆ disable

hour/minutes/seconds
month/day/yearhour/minutes/seconds
day/month/year

hour/minutes/seconds



month/day/year



day/month/year



See section 5.4.5 for details.

TIME STAMPING DELIMITER (M8300 SERIES ONLY)

enable



select delimiter



◆ disable

Read 2 HEX characters in the range **00-FE**.

See section 5.4.6 for details.

POWER SAVE



Sleep State
Enter Sleep Timeout



Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

Enter Configuration



POWER SAVE

Exit and Save



SLEEP STATE

◆ disable



enable



See section 5.5.1 for details.

For M8300 series readers, sleep state is entered immediately after reading a code and is not configurable.

ENTER SLEEP TIMEOUT



enter sleep timeout



Read 2 numbers in the range 00-99:

00 = Enter Sleep state immediately

01-99 = corresponds to a max. 9.9 sec. delay before entering the Sleep state.

◆ enter sleep timeout = 0.6 sec.

See section 5.5.2 for details.

READING PARAMETERS

⊙	Trigger Type	⊙
⊙	Trigger Signal	⊙
⊙	Trigger Click	⊙
⊙	Trigger-off Timeout	⊙
⊙	Flash Mode	⊙
⊙	Reads per Cycle	⊙
⊙	Safety Time	⊙
⊙	Beeper Intensity	⊙
⊙	Beeper Tone	⊙
⊙	Beeper Type	⊙
⊙	Beeper Length	⊙
⊙	Good Read Spot Duration	⊙
⊙	Aiming System	⊙
⊙	Cradle Beeper Intensity	⊙

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.



TRIGGER TYPE

◆ hardware trigger



Restores TRIGGER MODE

software trigger



Enables FLASH MODE

always on



TRIGGER SIGNAL

◆ trigger active level



trigger active pulse



See section 5.6.1 for details.

TRIGGER CLICK

◆ disable



enable



See section 5.6.2 for details.

**TRIGGER-OFF TIMEOUT**

trigger-off timeout

**Read 2 numbers in the range 00-99:**

00 = disables the trigger-off timeout

01-99 = corresponds to a max. 99-sec. delay after the trigger press to allow the reader to turn off automatically.

◆ trigger-off timeout disabled

See section 5.6.3 for details.

FLASH MODE

"FLASH" ON duration



"FLASH" OFF duration

**Read 2 numbers in the range 01-99:**

01 to 99 = from .1 to 9.9 seconds.

◆ Flash-ON = 1 sec. Flash-OFF = 0.6 sec

READS PER CYCLE

◆ one read per cycle



multiple reads per cycle



See section 5.6.4 for details.

***SAFETY TIME***

safety time

Limits same code consecutive reading.**Read 2 numbers in the range 00-99:**

00 = no same code consecutive reading until reader is removed (no decoding) for at least 400 ms.

01-99 = timeout from .1 to 9.9 seconds before a consecutive read on same code.

◆ safety time = 0.5 sec

See section 5.6.5 for details.

BEEPER INTENSITY

* very low intensity



low intensity



medium intensity



◆ high intensity



*This sets the beeper OFF for data entry, while for all other beeper signals it has the meaning "very low intensity". The Beeper Intensity parameter is effective for all operating conditions described in section 7.5.

Enter Configuration



READING PARAMETERS

Exit and Save



BEEPER TONE

tone 1



◆ tone 2



tone 3



tone 4



BEEPER TYPE

◆ monotone



bitonal



BEEPER LENGTH

long



◆ short



Enter Configuration



READING PARAMETERS

Exit and Save



GOOD READ SPOT DURATION

disable



short



◆ medium



long



AIMING SYSTEM

◆ disabled



enabled



CRADLE BEEPER INTENSITY

disable



low intensity



medium intensity



◆ high intensity



DECODING PARAMETERS

⊙	Ink Spread	⊙
⊙	Overflow Control	⊙
⊙	Interdigit Control	⊙
⊙	Decoding Safety	⊙
⊙	Puzzle Solver™	⊙



Before changing these parameter values read the descriptions in section 5.7.

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.

◆ = Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

Enter Configuration



DECODING PARAMETERS

Exit and Save



INK SPREAD

disable



◆ enable



See section 5.7.1 for details.

OVERFLOW CONTROL

disable



◆ enable



See section 5.7.2 for details.

INTERDIGIT CONTROL

disable



◆ enable



See section 5.7.3 for details.



DECODING SAFETY

◆ one read



(decoding safety disabled)

two reads



three reads



four reads



Required number of good reads before accepting code.

PUZZLE SOLVER™

◆ disable



enable



In the case of damaged or poorly printed codes, this parameter allows reading multiple parts of the single code to reconstruct it.

To read codes using this technology, simply move the illuminated bar over the code so that each line of the code is scanned. During this process a series of brief “ticks” indicates that reading is proceeding correctly.

Conditions:

- This parameter is only valid for the following codes:

EAN 8 without Add-on	EAN 13 without Add-on	UPC A without Add-on
Code 128	Code 39	

- **For Code 39, Check digit control is forced.**
- PuzzleSolver™ is not valid for ISBT 128 code.

CODE SELECTION

⊙	Auto-configuration	⊙
⊙	EAN/UPC Family	⊙
⊙	2/5 Family	⊙
⊙	Code 39 Family	⊙
⊙	Code 128 Family	⊙
⊙	Codabar Family	⊙
⊙	Code 93	⊙
⊙	MSI	⊙
⊙	Code 11	⊙
⊙	Code 16K	⊙
⊙	Code 49	⊙
⊙	GS1 DATABAR Codes	⊙

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

Code selections may be performed according to two different procedures:

- **Auto-configuration**, allowing an automatic recognition and selection of the code families to be read;
- **Manual configuration**, requiring configuration and selection of each code family to be read.

AUTO-CONFIGURATION

The following codes do not require reading the Enter and Exit configuration codes.

In auto-configuration mode the reader enters a particular state, during which it reads, recognizes and saves all information received from the decoding of an existing code (with the exception of MSI, Code 49 and Code 16k code types). In this way, the code families will be automatically configured.

It is possible to configure up to 10 code types, whose length is variable and check digit ignored. If reading different codes belonging to the same family, information about the last code will overwrite the information about the previous one.

Follow the given procedure to auto-configure the desired code families:



CAUTION

If no code is read during the auto-configuration procedure (step ②), the configuration will be empty and therefore the reader will be unable to read codes.

- ① Read the following code to enter the auto-configuration mode:



auto-configuration



- ② Read an existing code belonging to the code families that you need to configure.
- ③ Read the following code to save the configuration automatically and return to the reader's normal functioning:

save auto-configuration



If you need to change the configuration, repeat the auto-configuration procedure, follow the manual configuration by setting the parameters for each single code family or read the "Restore Default" code on page 164. Be careful that in the latter case all reader parameters will be restored.



DISABLE ALL CODE FAMILIES
**NOTE**

The reader allows up to 10 code selections. This does not limit the number of CODES enabled to 10, as it depends on the code family.

SINGLE SELECTIONS =

- **ONE** combination code from the EAN family
- ONE code from the 2/5 family

Example:

5 code selections:

1. **2/5 Interleaved**
2. **2/5 Industrial**
3. Code 128 + EAN 128
4. Code 39 Full ASCII + Code 32
5. **UPC A/UPC E**
6. **etc.**

In this section all **SINGLE** code selections are **underlined and in bold**.



CODE SELECTION



EAN/UPC FAMILY

disable the family



① Read the desired family code

NOTE: Since the EAN/UPC without ADD ON code selection is enabled by default, to correctly enable another selection, first disable the family.

EAN 8/EAN 13/UPC A/UPC E with and without ADD ON

WITHOUT ADD ON◆ **EAN 8/EAN 13/UPC A/UPC E****EAN 8/EAN 13****UPC A/UPC E**

WITH ADD ON 2 AND 5**EAN 8/EAN 13/UPC A/UPC E****EAN 8/EAN 13****UPC A/UPC E**

Enter Configuration



CODE SELECTION

Exit and Save



WITH ADD ON 2 ONLY

EAN 8/EAN 13



UPC A/UPC E



WITH ADD ON 5 ONLY

EAN 8/EAN 13



UPC A/UPC E



WITH AND WITHOUT ADD ON

◆ EAN/UPC with and without ADD ON no
Autodiscrimination



EAN/UPC Autodiscrimination ADD ON
by Prefix



By setting the EAN/UPC Autodiscrimination ADD ON by Prefix, the desired prefixes must be selected by reading the corresponding codes given in the following section, since no prefix is configured by default.



SELECT EAN/UPC PREFIXES

**NOTE**

When scanning the following codes, barcodes starting with the selected prefixes will be read and transmitted only if the ADD ON is present. If no ADD ON is found, the barcode will not be read. Barcodes starting with different characters are read regardless of ADD ON presence and transmitted always without ADD ON.

◆ Cancel All Selections

OR

select one or more of the following prefixes:

378/379434/439414/419977978979

The commands above are not mutually exclusive. They can be used to configure more than one set of prefixes simultaneously.



CODE SELECTION

**Example:**

The following string allows reading and transmitting with ADD ON all EAN/UPC starting with the 434/439, 977 and 978 prefixes:

1. EAN/UPC Autodiscrimination ADD ON by Prefix.
2. *434/439*: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 434/439 prefixes.
3. *977*: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 977 prefix.
4. *978*: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 978 prefix.



To clear the current prefix selections:

1. Cancel all Selections

Cancel All Selections





EAN/UPC CHECK DIGIT TX SELECTIONS

For each code type in this family you can choose to transmit the check digit or not

CHECK DIGIT TRANSMISSION

◆ EAN 8



◆ EAN 13



◆ UPC A



◆ UPC E

**NO CHECK DIGIT
TRANSMISSION**

EAN 8



EAN 13



UPC A



UPC E





CONVERSION OPTIONS

UPC E to UPC A conversion



UPC E to EAN 13 conversion



UPC A to EAN 13 conversion



EAN 8 to EAN 13 conversion



Enable only ISBN conversion



Enable only ISSN conversion

Enable both ISBN and ISSN
conversionDisable both ISBN and ISSN
conversion

**2/5 FAMILY**

disable the family



① Read the desired family code

◆ Interleaved 2/5**Normal 2/5 (5 Bars)****Industrial 2/5 (IATA)****Matrix 2/5 (3 Bars)**

The pharmaceutical code below is part of the 2/5 family but has no check digit or code length selections.

Code CIP/HR

French pharmaceutical code

② Read a check digit selection

CHECK DIGIT TABLE

no check digit control



◆ check digit control and transmission



check digit control without transmission

③ Read **4** numbers for the code length where:

- **First 2 digits** = minimum code length.
- **Second 2 digits** = maximum code length.

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples:

0199 = variable from 1 to 99 digits in the code.

1010 = 10 digit code length only.

**CODE 39 FAMILY**

disables the family



① Read the desired family code



◆ Standard Code 39



Full ASCII Code 39



② Read a check digit selection

CHECK DIGIT TABLE

◆ no check digit control

check digit control
and transmissioncheck digit control
without transmission

The pharmaceutical codes below are part of the Code 39 family but have no check digit selections.

Code CIP39



French pharmaceutical code

Code 32



Italian pharmaceutical code

CODE LENGTH (OPTIONAL)

The code length selection is valid for the entire Code 39 family

Read the code + 4 numbers for the code length where:

First 2 digits = minimum code length.

Second 2 digits = maximum code length.

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

set code length





CODE 128 FAMILY

disable the family



- ① Read the desired family code

◆ Code 128

control without transmission of
check digit

EAN 128

control without transmission of
check digit

ISBT 128

enabling ISBT 128 automatically
disables Puzzle Solver™.

TRANSMIT GS BEFORE CODE

Code EAN 128 uses the ASCII <GS> character to separate a variable length code field from the next code field. This character can also be transmitted before the code.

◆ disable



enable



If the <GS> character has been modified in the Character Replacement parameter, the new character is affected by this command.

CODE LENGTH (OPTIONAL)

The code length selection is valid for the entire Code 128 family and is calculated on the output string.

Read the code + 4 numbers for the code length where:

First 2 digits = minimum code length.

Second 2 digits = maximum code length.

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

set code length



**CODE 93**

◆ disable the code



Code 93

control without
transmission of check digit**CODABAR FAMILY**

◆ disable the family



① Read the desired equality control code

② Read a start/stop transmission
selection

Standard Codabar

no start/stop character equality
control**START/STOP CHARACTER
TRANSMISSION**

no transmission



Standard Codabar



start/stop character equality control

transmission





CODE SELECTION



The Codabar ABC code below uses a fixed start/stop character transmission selection.

Codabar ABC



no start/stop character equality control but transmission.

CODABAR ABC FORCED CONCATENATION

enable Codabar ABC with forced concatenation



non start/stop character equality control but transmission

CODE LENGTH (OPTIONAL)

The code length selection is valid for the entire Codabar family

Read the code + **4** numbers for the code length where:

First 2 digits = minimum code length.

Second 2 digits = maximum code length.

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

set code length



START/STOP CHARACTER CASE IN TRANSMISSION

The start/stop character case selections below are valid for the entire Codabar family:

transmit start/stop characters in lower case



transmit start/stop characters in upper case





MSI

◆ disable the family



Enable the code by selecting one of the check digit selections.

no check digit control



MOD10 check digit control
no check digit transmission



MOD10 check digit control
check digit transmission



MOD11 - MOD10 check digit control
no check digit transmission



MOD11 - MOD10 check digit control
check digit transmission



MOD10 - MOD10 check digit control
no check digit transmission



MOD10 - MOD10 check digit control
check digit transmission





CODE 11

◆ disable the family



Enable the code by selecting one of the check digit selections.

no check digit control



Type C check digit control
check digit transmitted



Type C check digit control
check digit not transmitted



Type K check digit control
check digit transmitted



Type K check digit control
check digit not transmitted



Type C and Type K
check digit control
check digits transmitted



Type C and Type K
check digit control
check digits not transmitted





CODE 16K

◆ disable the code

**Code 16K**

To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief “ticks” indicates that reading is proceeding correctly.

CODE 49

◆ disable the code

**Code 49**

To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief “ticks” indicates that reading is proceeding correctly.



GS1 DATABAR™ CODES

◆ disable the family

**DISABLE CODE**

disable GS1 DataBar Expanded Linear and Stacked



disable GS1 DataBar Limited



disable GS1 DataBar 14 Linear and Stacked

**ENABLE CODE**

enable GS1 DataBar Expanded Linear and Stacked



enable GS1 DataBar Limited



enable GS1 DataBar 14 Linear and Stacked



To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief “ticks” indicates that reading is proceeding correctly.

ADVANCED FORMATTING

NOT FOR PEN INTERFACES

⊙	Concatenation	⊙
⊙	Advanced Formatting	⊙



NOTE

Please follow the setup procedure carefully for these parameters.



NOTE

The Advanced Formatting parameters may not be compatible with the IBM USB POS interface selection.

Read the **Enter Configuration** code ONCE, available at the top of page.

Read configuration codes precisely following the numbered procedure given.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of page.



CONCATENATION

◆ disable



enable



Permits the concatenation of two codes defined by code type and length. It is possible to set a timeout for the second code reading and to define code transmission if the timeout expires.

The order of transmission is **CODE 1-CODE 2**.

Define Concatenation

1**Code 1**

code ID



Read the code type from the Code Identifier Table beginning in Appendix B.

code length



Read a number in the range **01-99** from the Hex/Numeric Table.

ADVANCED FORMATTING

2**Code 2**

code ID



Read the code type from the [Code Identifier Table](#) beginning in Appendix B.



code length



Read a number in the range **01-99** from the Hex/Numeric Table.

3**Concatenation Result Code ID**

use code 1 ID



use code 2 ID



Since you can concatenate codes from different families, you must select the Code ID character of the resulting code. The Code ID character will be sent in the output message only if it is enabled according to the Code Identifier selection (Manufacturer, AIM, or Custom).

4**Concatenation Timeout**

timeout



Read two numbers in the range **00** to **99**

00= no timeout

01-99 = timeout from 1 to 99 seconds

Define the timeout, which determines the valid waiting period between the two codes, in order to accept concatenation. If the timeout expires, the resulting action will be based on the following selection. (HHDII)

5

Transmission after Timeout

no code transmitted
 after timeout



only code 1 transmitted
 (if read) after timeout



only code 2 transmitted
 (if read) after timeout



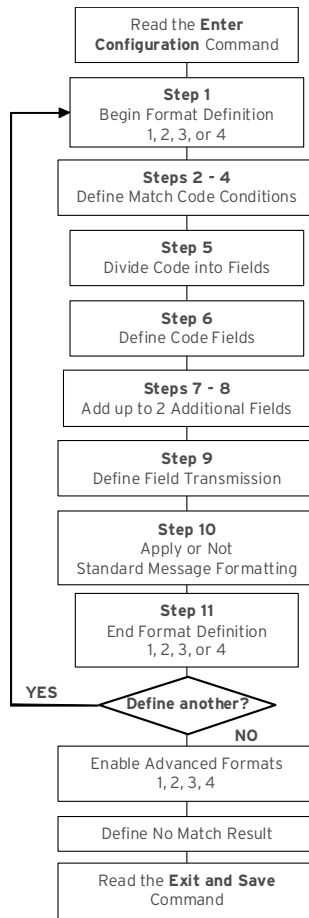
either code 1 or code 2 transmitted
 after timeout



ADVANCED FORMATTING

ADVANCED FORMATTING

Advanced formatting has been designed to offer you complete flexibility in changing the format of barcode data **before** transmitting it to the host system. This formatting will be performed when the barcode data meets certain criteria, which you will define in the following procedure. Up to 4 advanced code management formats can be defined and saved in memory. For each format you must complete the entire configuration procedure:



**1****Begin Format Definition**

begin Format 1 definition



begin Format 2 definition



begin Format 3 definition



begin Format 4 definition

**2****Match Code Type**

match code type

Read the above code + the code type to match from the [Code Identifier Table](#) in Appendix B.**OR**

any code type

**3****Match Code Length**

match code length

Read the above code + two numbers in the range **01** to **99** for the exact code length.**OR**

any code length





ADVANCED FORMATTING

4

Match with Predefined Characters

no match



OR

match with 1 character



match with a 2-character string



match with a 3-character string



match with a 4-character string



After selecting the predefined match code, read the character(s) from the HEX table. Range of characters = **00-FE**.

Example:

Match code with the 2-character predefined string = "@@".

Match with a 2-character string

Read



+ 40 + 40

AND

position of first character in predefined string



Read the above code + two numbers in the range **01** to **99** representing the character position in the code where the first character of the predefined string must be found.

Read **00** if the match string can be found in any character position.

See section 5.8.1 for details.

5

Divide Code into Fields



divide code into fields



Read one number in the range **1** to **5** to divide the code into fields.

6

Define Code Fields

define code fields

Each code field length can be set by either:

- a) defining a field separator character to be found in the code itself. In this case you can choose to **discard** the code separator character or **include** it as the last character of the field.

OR BY

- b) defining a match character to be found consecutively repeated in the code itself. In this case the field ends with the first character that does not match.

OR BY

- c) specifying a specific character length up to the maximum of 99 characters.

OR BY

- d) selecting the last field as variable length (if any).

You must define the same number of fields as selected in step 5, including fields that will not be transmitted.



ADVANCED FORMATTING

DEFINE FIELD 1 BY: EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator



include separator



OR

b)

match character



Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c)

field length



Read two numbers in the range **01** to **99** to define the field length.

OR

d)

this is the last field (variable length)



AND

Field 1 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.



ADVANCED FORMATTING

DEFINE FIELD 2 BY:

EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator



include separator



OR

b)

match character



Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c)

field length



Read two numbers in the range **01** to **99** to define the field length.

OR

d)

this is the last field (variable length)



AND

Field 2 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.



ADVANCED FORMATTING

DEFINE FIELD 3 BY:

EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator



include separator



OR

b)

match character



Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c)

field length



Read two numbers in the range **01** to **99** to define the field length.

OR

d)

this is the last field (variable length)



AND

Field 3 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.



ADVANCED FORMATTING

DEFINE FIELD 4 BY: EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator



include separator



OR

b)

match character



Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c)

field length



Read two numbers in the range **01** to **99** to define the field length.

OR

d)

this is the last field (variable length)



AND

Field 4 Terminators

no field terminators



1 field terminator



2 field terminators




Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.

ADVANCED FORMATTING





DEFINE FIELD 5 BY:
EITHER

a) field separator



Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator include separator


OR


b) match character



Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c)  field length



Read two numbers in the range **01** to **99** to define the field length.

OR

d)  this is the last field (variable length)



AND

Field 5 Terminators

no field terminators



1 field terminator 2 field terminators




Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.

ADVANCED FORMATTING

7

First Additional Fixed Field

no fixed field



1 character fixed field



2 character fixed field



3 character fixed field



4 character fixed field



5 character fixed field



6 character fixed field



After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.

Example:

4 Character Fixed Field



+ 4D + 41 + 49 + 4E = MAIN

ADVANCED FORMATTING

8

Second Additional Fixed Field

no fixed field



1 character fixed field



2 character fixed field



3 character fixed field



4 character fixed field



5 character fixed field



6 character fixed field



After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**. For Wedge and USB-KBD interface, it is also possible to read the **Special Key(s)** on page 73.

Example:

3 Character Fixed Field



+ 53 + 45 + 54 = SET

Field Transmission

number of fields to transmit


Read one number in the range **1** to **7** for the number of fields to transmit. **Include only fields to be transmitted.**

Field Order Transmission

Read the codes corresponding to the fields to transmit in the order in which they are to be transmitted. A field can be transmitted more than once. See example.

field 1



field 3



field 5



additional field 2



field 2



field 4



additional field 1



Example:

The barcode is divided into 3 defined fields plus 1 additional fixed field.
Transmit in the order: Field 2, Additional Field 1, Field 1, Field 2.

Number of Fields

to Transmit



+ 4 +

Field 2



+

Additional Field 1

+

Field 1

+

Field 2

10

Standard Formatting

do not apply standard formatting



apply standard formatting



POWERSCAN™ D8330: After performing Advanced Formatting on the barcode read, Standard Formatting (Headers, Code Length, Code ID, Terminators) can be applied to the message to be transmitted.

POWERSCAN™ M8300: After performing Advanced Formatting on the barcode read, Standard Formatting (Code Length, Code ID) can be applied to the message to be transmitted.

11

End Format Definition

end Format 1 definition



end Format 2 definition



end Format 3 definition



end Format 4 definition





ADVANCED FORMATTING



Enable Advanced Format

◆ no Advanced Formats enabled



Advanced Format 1

enable



disable



Advanced Format 2

enable



disable



Advanced Format 3

enable



disable



Advanced Format 4

enable



disable





No Match Result

clear data - no transmission

transmit data using standard
format

This selection determines the action to be taken when codes read do not conform to the advanced format requisites (no match).

- Codes not matching can be ignored, cleared from memory and not transmitted.
- Codes not matching can be transmitted using the Standard formatting (Headers, Code Length, Code ID, Terminators).

RADIO PARAMETERS

PowerScan™ M8300 Series readers only

⊙	Radio Protocol Timeout	⊙
⊙	Radio RX Timeout	⊙
⊙	Power-Off Timeout	⊙
⊙	Transmission Mode	⊙
⊙	Beeper Control for Radio	⊙
	Response	
⊙	Single Store	⊙
⊙	Batch Mode	⊙
⊙	Find Me	⊙

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.



RADIO PROTOCOL TIMEOUT


radio protocol timeout



Read a number from the table where:
02-19 = timeout from **2** to **19** seconds

◆ 2 seconds

See section 5.9.1 for details.

RADIO RX TIMEOUT

radio RX timeout

◆ disable



always on



Specify timeout



Read 2 numbers in the range 05-99:
05-99 = Radio RX timeout range from 05 to 99 seconds.

**NOTE****This functionality is available only for stand-alone layout.**

See section 5.9.2 for details.



POWER-OFF TIMEOUT

power-off timeout



Read 2 numbers in the range 00-99:

00 = Power-off disabled; reader always ready
01-99 = corresponds to a max. 99 hour delay before power-off.

◆ power-off after 4 hours.

See par 5.9.3 for details.

TRANSMISSION MODE

◆ One Way



Two-ways



See section 5.9.4 for details.

Enter Configuration



RADIO PARAMETERS

Exit and Save



BEEPER CONTROL FOR RADIO RESPONSE

◆ normal



only good decode



only good reception



off



See section 5.9.5 for details.



SINGLE STORE

◆ disable



one attempt



two attempts



three attempts



four attempts



five attempts



six attempts



seven attempts



eight attempts



nine attempts



See section 5.9.6 for details

Enter Configuration



RADIO PARAMETERS

Exit and Save



BATCH MODE

◆ disable batch



enable normal batch



enable automatic batch



See section 5.9.7 for details.

The following batch management parameters are complete commands and do not require reading the Enter and Exit configuration codes.

start normal batch transmission



#+BFlush

delete batch data



#+BReset

FIND ME

disable



◆ enable



See section 5.9.8 for details.

DISPLAY AND KEYPAD PARAMETERS

PowerScan™ M8300 Series Display and 3-Key readers only

⊙	Date and Time	⊙
⊙	Contrast	⊙
⊙	Font Size	⊙
⊙	Backlight	⊙
⊙	Display Off Timeout	⊙
⊙	Display Mode	⊙
⊙	Keypad	⊙

Read the **Enter Configuration** code ONCE, available at the top of each page.

Read configuration codes from the desired groups.



= Read the code and follow the procedure given



= Default value

Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

Enter Configuration



DISPLAY PARAMETERS

Exit and Save



DISPLAY PARAMETERS

DATE AND TIME

set date



Read 6 numbers for DDMMYY

set time



Read 4 numbers for HHMM

CONTRAST

lighter



darker



Read the code until the desired contrast is reached.

FONT SIZE

◆ small



medium



large



BACKLIGHT

◆ backlight off



backlight on





DISPLAY-OFF TIMEOUT

timeout



Read 2 numbers in the range 00-99:
00 = disables display timeout (always on)
01 to 99 = timeout from 1 to 99 seconds.

◆ display-off after 8 seconds.

◆ delay disabled

DISPLAY MODE

normal



◆ local echo



clear display after decode



See section 5.10.1 for details.



KEYPAD

disable 3-key keypad



◆ enable 3-key keypad and select characters



Read 3 HEX characters in the range **00-FF**, corresponding to the left, center and right keys respectively.

FF = KeyID disabled

◆ left = '←'
 center = '⇌'
 right = '→'

See section 6.3 for details.

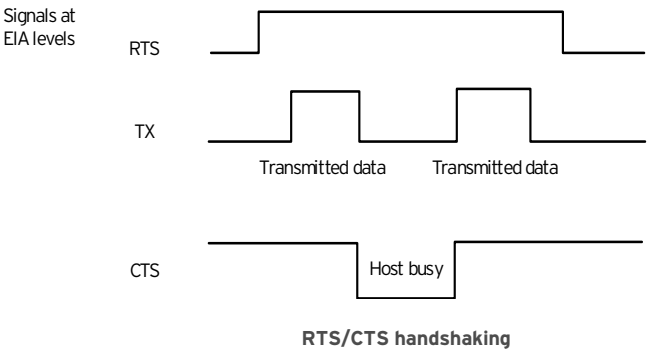
5 REFERENCES

5.1 RS-232 PARAMETERS

5.1.1 Handshaking

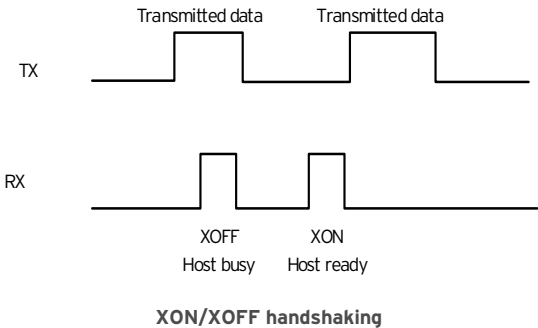
Hardware handshaking: (RTS/CTS)

The RTS line is activated by the decoder before transmitting a character. Transmission is possible only if the CTS line (controlled by the Host) is active.



Software handshaking: (XON/XOFF)

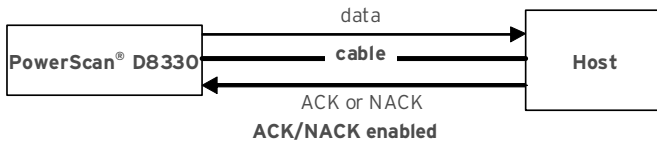
During transmission, if the Host sends the XOFF character (13 Hex), the decoder interrupts the transmission with a maximum delay of one character and only resumes when the XON character (11 Hex) is received.



5.1.2 ACK/NACK Protocol

PowerScan™ D8330 Readers

This parameter sets a transmission protocol in which the Host responds to the reader after every code transmitted. The Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception.



If the reader does not receive an ACK or NACK, transmission is ended after the RX Timeout (see section 5.1.4).

When ACK/NACK protocol is enabled, FIFO must be disabled manually, see section 5.1.3.

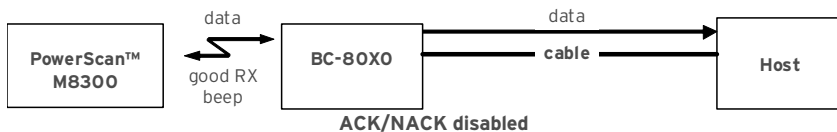
PowerScan™ M8300 Readers

The transmission protocol takes place between reader, cradle and Host. The reader passes its data (code read) to the cradle, which sends it to the Host. The management of responses (from Host or cradle) depends on the Transmission Mode parameter, see section 5.9.4.

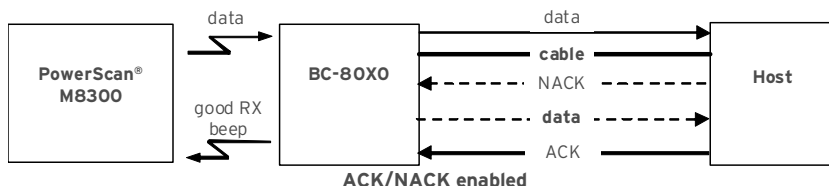
In the following descriptions the completed transmission is indicated by the Beeper Control for Radio Response parameter with its default setting to Normal, see section 5.9.5.

When ACK/NACK is disabled (in One-Way tx mode), there is no control from cradle to Host transmission, the reader responds with the good reception tone.

Transmission Mode = One-Way



Transmission Mode = Two-Ways



When ACK/NACK is enabled (in Two-Way tx mode), the Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception. Only after the ACK character is received by the BC-80X0 does the reader respond with the good reception tone.

If the BC-80X0 does not receive an ACK or NACK, transmission is ended after the RX Timeout, see section 5.1.4. See also Radio Protocol Timeout, section 5.9.1.

When ACK/NACK protocol is enabled, FIFO must be disabled manually, see section 5.1.3.

5.1.3 FIFO

PowerScan™ D8330 Readers

This parameter determines whether data (barcodes) are buffered on a First In First Out basis allowing faster data collection in certain cases for example when using slow baud rates and/or hardware handshaking.

If the FIFO buffering is enabled, codes are collected and sent out on the serial line in the order of acquisition. About 800 characters can be collected (buffer full), after which the reader signals an error and discards any further codes until the transmission is restored.

If the FIFO buffering is disabled, each code must be transmitted before another one can be read.

PowerScan™ M8300 Readers

If enabled, the BC-80X0 collects all messages sent by PowerScan™ M8300 and sends them in order of acquisition to the connected Host.

If disabled, PowerScan™ M8300 blocks message transmission until the BC-80X0 has completed transmission towards the Host.

5.1.4 RX Timeout

When the RS-232 interface is selected, the Host can be used to configure the device by sending it command strings (see Appendix A).

This parameter can be used to automatically end data reception from the Host after the specified period of time.

If no character is received from the Host, after the timeout expires, any incomplete string (any string not terminated by <CR>) is flushed from the device buffer.

5.2 PEN PARAMETERS

5.2.1 Minimum Output Pulse

This parameter sets the duration of the output pulse corresponding to the narrowest element in the barcode. In this way the code resolution is controlled by the signal sent to the decoder, independently of the physical resolution of the code read.

The shortest pulse (200 μ s) corresponds to a high-resolution code emulation and therefore a shorter transfer speed to the decoder (for decoders able to work on high resolution codes). Likewise, longer pulses correspond to low-resolution code emulation and therefore a longer transfer time to the decoder.

5.2.2 Conversion to Code 39 and Code 128

PowerScan™ D8330 Series Readers

When using these readers it is possible to convert all codes to Code 39. By disabling this option the decoded codes will be transmitted in their original format, except for the following codes, which are ALWAYS converted into Code 39 format: MSI, Code 11, Code 16K, Code 49, GS1 DataBar™.

PowerScan™ M8300 Series Readers

When using these readers it is possible to choose between converting the decoded codes into either Code 39 format or Code 128 format. It is not possible to disable conversion.

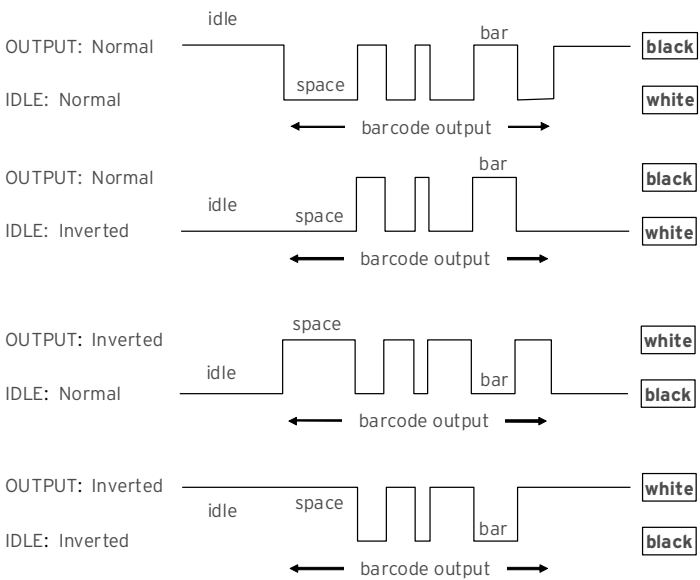
5.2.3 **Overflow**

This parameter generates a white space before the first bar and after the last bar of the code. The selections are as follows:

- narrow = space 10 times the minimum output pulse.
- medium = space 20 times the minimum output pulse.
- wide = space 30 times the minimum output pulse.

5.2.4 **Output and Idle Levels**

The following state diagrams describe the different output and idle level combinations for Pen emulation:



Output and Idle Levels

5.2.5 Inter-Block Delay

For the PEN Emulation interface, data are sent to the Host in fixed size blocks of 20 characters each. The inter-block delay parameter allows setting a delay between each block sent to the Host.

5.3 NETWORK PARAMETERS

5.3.1 Slave Address Range First/Last

These parameters define the valid addresses for the Slave cradles on the network. Valid values are in the range 0 to 1999. However, the maximum number of cradles in a single network is 16, (including the Master if present). All cradles in the system must have different addresses.

To reduce system boot time, it is recommended to number the Slaves consecutively, while it is not necessary that the Master cradle address is contained in the range. The network addresses correspond to the radio addresses, see section 4.7.

At system power-up, the Master searches for and initializes all the Slaves found in the valid address range. During this phase the yellow LED on the Master cradle blinks. The time to complete the start up procedure varies depending on the complexity of the network but is typically between a few seconds to a few minutes. Start up cannot be interrupted. At the end of this procedure the system will be operative and can collect data from all devices.



CAUTION

All Slaves must be powered up either before or together with the Master. Slaves successively powered will not be recognized by the system even if their address is in the specified range.

5.3.2 Network Warning Message

The Master cradle can transmit warning messages to the Host regarding some network errors.

/*Slave xxxx not responding*/: when the Master can no longer communicate with the specified Slave previously identified at start up.

/*Frame out of sequence for terminal xxxx*/: if a reader is sending data packets out of sequence. This can happen if there are transmission problems on the network (either connection or communication), or if the reader has correctly transmitted data to a device not on the network (reader configuration error).

The message is sent in the following format:

"Message" CR LF

5.3.3 Reception Warning Message

The Master cradle can transmit warning messages to the Host regarding wrong reception of data.

Example:

/*Two-Ways Out of Sequence!(.....)*/

This message is transmitted to the Host by the Master cradle when the Master cradle receives a closing string from the Host for a Two-way tx communication, but this was either not open or already closed, therefore the data will be lost. See section 5.9.4.

5.3.4 Master Header/Terminator Selection

In addition to the standard header/terminator selection, the Master cradle can add its own header/terminator to the entire message sent to the Host.

In the STAR-System™ network headers and terminators for all RF Devices are disabled by default.

The Master header and terminator default values are as follows depending on the interface selection towards the Host:

RS-232: no header, terminator CR-LF
WEDGE: no header, terminator ENTER

See sections 5.4.1 and 5.4.2.

5.4 DATA FORMAT

For an overview of Message Formatting see Chapter 6.

5.4.1 Header/Terminator Selection

The header/terminator selection is not effected by the reading of the restore default code. In fact, header and terminator default values depend on the interface selection:

RS-232: no header, terminator CR-LF

WEDGE: no header, terminator ENTER

These default values are always restored through the reading of RS-232 or WEDGE interface selection code, see chapter 2.

For the WEDGE interface, the following extended keyboard values can also be configured:

EXTENDED KEYBOARD TO HEX CONVERSION TABLE				
	IBM AT IBM 3153 APPLE ADB	IBM XT	IBM 31xx, 32xx, 34xx, 37xx	Wyse Digital
HEX	KEY	KEY	KEY	KEY
83	ENTER	ENTER	FIELD EXIT	RETURN
84	TAB	TAB	TAB	TAB
85	F1	F1	F1	F1
86	F2	F2	F2	F2
87	F3	F3	F3	F3
88	F4	F4	F4	F4
89	F5	F5	F5	F5
8A	F6	F6	F6	F6
8B	F7	F7	F7	F7
8C	F8	F8	F8	F8
8D	F9	F9	F9	F9
8E	F10	F10	F10	F10
8F	F11	ESC	F11	F11
90	F12	BACKSPACE	F12	F12
91	HOME	HOME	ENTER	F13
92	END	END	RESET	F14
93	PG UP	PG UP	INSERT	F15
94	PG DOWN	PG DOWN	DELETE	F16
95	↑	↑	FIELD -	UP
96	↓	↓	FIELD +	DOWN
97	←	←	ENTER (Paddle)	LEFT
98	→	→	PRINT	RIGHT
99	ESC	ESC		ESC
9A	CTRL (Right)	CTRL (Right)		CTRL (Right)
9B	Euro	Space	Space	Space

For all devices using IBM AT (compatible) Wedge or USB-KBD interfaces, all values from **9C** to **FE** send the relative simulated keypress when available or else the relative ALT-Mode sequence. See the Hex to Character Conversion Table in Appendix C.

For all devices using other Wedge interfaces, all values from **9C** to **FE** send the Space character.



5.4.2 Define Special Key Sequence

The Special Key(s) for **Wedge IBM AT-PS/2 and USB-KBD interface users** can be associated with a sequence of keyboard keys that otherwise could not be selected, i.e. ALT + F6, SHIFT + F1. These Special Keys can be used for:

- Headers/Terminators
- Character Replacement
- Field Adjustment
- Custom Code ID
- Advanced Formatting - Define Field
- Advanced Formatting - Additional Fixed Field

Follow the procedure to define the desired Special Key sequence:

1. Read the Enter Configuration code above and select the Special Key to define (one at a time):

Define Special Key 1



Define Special Key 2



Define Special Key 3



Define Special Key 4



Define Special Key 5



2. Read only one code to be associated with the special key sequence:

SHIFT



OR

CTRL



OR

ALT



OR

CTRL + SHIFT



OR

ALT + SHIFT



OR

CTRL + ALT



3. Select the character to be associated with the Special Key sequence by reading the codes corresponding to the 3 character values from Appendix C. Then, read the Exit and Save Configuration code above to complete the Special Key sequence.

The character values having the ^s and ^A symbols **require** SHIFT or ALT keys or key combinations in **step 2**, in particular:

^s = the character is obtained in combination with SHIFT

^A = the character is obtained in combination with ALT

The following character values change according to the keyboard nationality.

CHAR \ KEYB	ITA	USA	FR	BE	DE	UK	ES	SW	JP
!	016 ^s	016 ^s	04A	03E	016 ^s	016 ^s	016 ^s	016 ^s	016 ^s
"	01E ^s	052 ^s	026	026	01E ^s	01E ^s	01E ^s	01E ^s	01E ^s
#	052 ^A	026 ^s	026 ^A	026 ^A	05D	05D	026 ^A	026 ^s	026 ^s
\$	025 ^s	025 ^s	05B	05B	025 ^s	025 ^s	025 ^s	025 ^A	025 ^s
%	02E ^s	02E ^s	052 ^s	052 ^s	02E ^s	02E ^s	02E ^s	02E ^s	02E ^s
&	036 ^s	03D ^s	016	016	036 ^s	03D ^s	036 ^s	036 ^s	036 ^s
'	04E	052	025	025	05D ^s	052	04E	05D	03D ^s
(	03E ^s	046 ^s	02E	02E	03E ^s	046 ^s	03E ^s	03E ^s	03E ^s
)	046 ^s	045 ^s	04E	04E	046 ^s	045 ^s	046 ^s	046 ^s	046 ^s
*	05B ^s	03E ^s	05D	05B ^s	05B	03E ^s	05B ^s	05D ^s	052 ^s
+	05B	055 ^s	055 ^s	04A ^s	05B	055 ^s	05B	04E	04C ^s
,	041	041	03A	03A	041	041	041	041	041
-	04A	04E	036	055	04A	04E	04A	04A	04E
.	049	049	041 ^s	041 ^s	049	049	049	049	049
/	03D ^s	04A	049 ^s	049 ^s	03D ^s	04A	03D ^s	03D ^s	04A
0	045	045	045 ^s	045 ^s	045	045	045	045	045
1	016	016	016 ^s	016 ^s	016	016	016	016	016
2	01E	01E	01E ^s	01E ^s	01E	01E	01E	01E	01E
3	026	026	026 ^s	026 ^s	026	026	026	026	026
4	025	025	025 ^s	025 ^s	025	025	025	025	025
5	02E	02E	02E ^s	02E ^s	02E	02E	02E	02E	02E
6	036	036	036 ^s	036 ^s	036	036	036	036	036
7	03D	03D	03D ^s	03D ^s	03D	03D	03D	03D	03D
8	03E	03E	03E ^s	03E ^s	03E	03E	03E	03E	03E
9	046	046	046 ^s	046 ^s	046	046	046	046	046

CHAR <small>KEYB</small>	ITA	USA	FR	BE	DE	UK	ES	SW	JP
:	049 ^S	04C ^S	049	049	049 ^S	04C ^S	049 ^S	049 ^S	052
;	041 ^S	04C	041	041	041 ^S	04C	041 ^S	041 ^S	04C
<	061	041 ^S	061	061	061	041 ^S	061	061	041 ^S
=	045 ^S	055	055	04A	045 ^S	055	045 ^S	045 ^S	04E ^S
>	061 ^S	049 ^S	061 ^S	061 ^S	061 ^S	049 ^S	061 ^S	061 ^S	049 ^S
?	04E	04A ^S	03A ^S	03A ^S	04E ^S	04A ^S	04E ^S	04E ^S	04A ^S
@	04C ^A	01E ^S	045 ^A	01E ^A	015 ^A	052 ^S	01E ^A	01E ^A	054
[	054 ^A	054	02E ^A	054 ^A	052 ^S	054	054 ^A	03E ^A	05B
\	00E	05D	03E ^A	061 ^A	04C ^S	061	00E ^A	04E ^A	051
]	05B ^A	05B	04E ^A	05B ^A	054 ^S	05B	05B ^A	046 ^A	05D
^	055 ^S	036 ^S	046 ^A	054	00E	036 ^S	054 ^S	05B ^S	055
_	04A ^S	04E ^S	03E	055	04A ^S	04E ^S	04A ^S	04A ^S	051 ^S
'(accent)	-	00E	03D ^A	05D ^A	055 ^S	00E	054	055 ^S	054 ^S
a	01C	01C	015	015	01C	01C	01C	01C	01C
b	032	032	032	032	032	032	032	032	032
c	021	021	021	021	021	021	021	021	021
d	023	023	023	023	023	023	023	023	023
e	024	024	024	024	024	024	024	024	024
f	02B	02B	02B	02B	02B	02B	02B	02B	02B
g	034	034	034	034	034	034	034	034	034
h	033	033	033	033	033	033	033	033	033
i	043	043	043	043	043	043	043	043	043
j	03B	03B	03B	03B	03B	03B	03B	03B	03B
k	042	042	042	042	042	042	042	042	042
l	04B	04B	04B	04B	04B	04B	04B	04B	04B
m	03A	03A	04C	04C	03A	03A	03A	03A	03A
n	031	031	031	031	031	031	031	031	031
o	044	044	044	044	044	044	044	044	044
p	04D	04D	04D	04D	04D	04D	04D	04D	04D
q	015	015	01C	01C	015	015	015	015	015
r	02D	02D	02D	02D	02D	02D	02D	02D	02D
s	01B	01B	01B	01B	01B	01B	01B	01B	01B
t	02C	02C	02C	02C	02C	02C	02C	02C	02C
u	03C	03C	03C	03C	03C	03C	03C	03C	03C
v	02A	02A	02A	02A	02A	02A	02A	02A	02A

CHAR \ KEYB	ITA	USA	FR	BE	DE	UK	ES	SW	JP
w	01D	01D	01A	01A	01D	01D	01D	01D	01D
x	022	022	022	022	022	022	022	022	022
y	035	035	035	035	01A	035	035	035	035
z	01A	01A	01D	01D	035	01A	01A	01A	01A
{	-	054 ^S	025 ^A	046 ^A	052	054 ^S	052 ^A	03D ^A	05B ^S
|	00E ^S	05D ^S	036 ^A	016 ^A	04C	061 ^S	016 ^A	061 ^A	06A ^S
}	-	05B ^S	055 ^A	045 ^A	054	05B ^S	05D ^A	045 ^A	05D ^S
~	-	00E ^S	01E ^A	04A ^A	04E	05D ^S	-	05B ^A	055 ^S

**NOTE**

To use uppercase letters, it is necessary to read one of the **SHIFT** commands from step 2 before the value corresponding to the lowercase letters.

The following key values are common to all the keyboard nationalities.

CHAR \ KEYB	ITA	USA	FR	BE	DE	UK	ES	SW	JP
ENTER	05A	05A	05A	05A	05A	05A	05A	05A	05A
TAB	00D	00D	00D	00D	00D	00D	00D	00D	00D
F1	005	005	005	005	005	005	005	005	005
F2	006	006	006	006	006	006	006	006	006
F3	004	004	004	004	004	004	004	004	004
F4	00C	00C	00C	00C	00C	00C	00C	00C	00C
F5	003	003	003	003	003	003	003	003	003
F6	00B	00B	00B	00B	00B	00B	00B	00B	00B
F7	083	083	083	083	083	083	083	083	083
F8	00A	00A	00A	00A	00A	00A	00A	00A	00A
F9	001	001	001	001	001	001	001	001	001
F10	009	009	009	009	009	009	009	009	009
F11	078	078	078	078	078	078	078	078	078
F12	007	007	007	007	007	007	007	007	007
Home	26C	26C	26C	26C	26C	26C	26C	26C	26C
End	269	269	269	269	269	269	269	269	269
PG UP	27D	27D	27D	27D	27D	27D	27D	27D	27D
PG down	27A	27A	27A	27A	27A	27A	27A	27A	27A

CHAR \ KEYB	ITA	USA	FR	BE	DE	UK	ES	SW	JP
Up arrow	275	275	275	275	275	275	275	275	275
Down arrow	272	272	272	272	272	272	272	272	272
Left arrow	26B	26B	26B	26B	26B	26B	26B	26B	26B
Right arrow	274	274	274	274	274	274	274	274	274
Esc	076	076	076	076	076	076	076	076	076
Ctrl right	214	214	214	214	214	214	214	214	214
€	02E ^A	02E ^A	024 ^A	024 ^A	024 ^A	025 ^A	02E ^A	02E ^A	-
SPACE	029	029	029	029			029		029

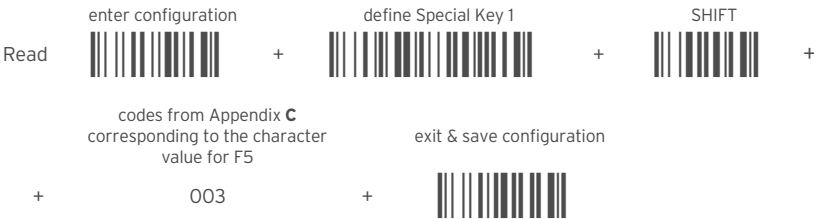


If Caps Lock Auto-Recognition is disabled, it is necessary to verify that the keyboard caps lock status matches the reader one.

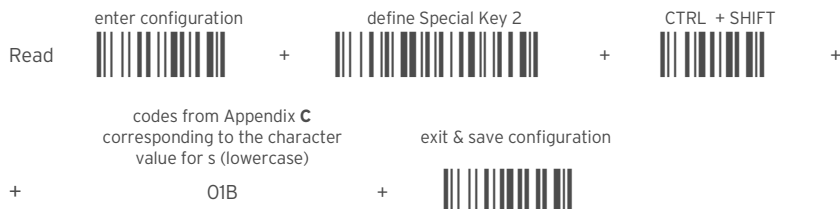
Examples:

- Defining Special Key Sequences -

- 1. The following example allows defining Special Key 1 as SHIFT + F5:



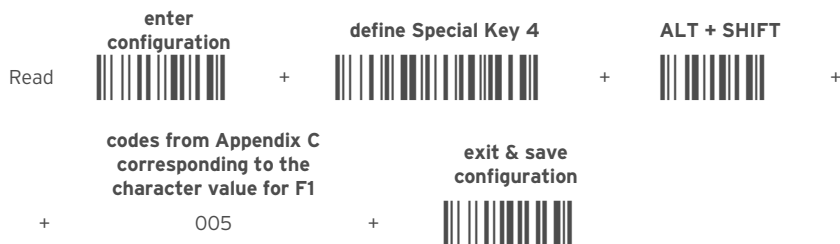
2. The following example allows defining Special Key 2 as CTRL + S (uppercase):



3. the following example allows defining Special Key 3 as Alt + F6:



4. The following example allows defining Special Key 4 as Alt + Shift + F1:

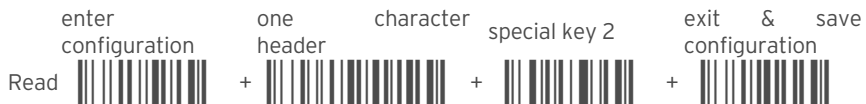


- Integrating Special Keys in Headers/Terminators -

1. The following example allows setting Special Key 1 (defined in example 1 above) as terminator:



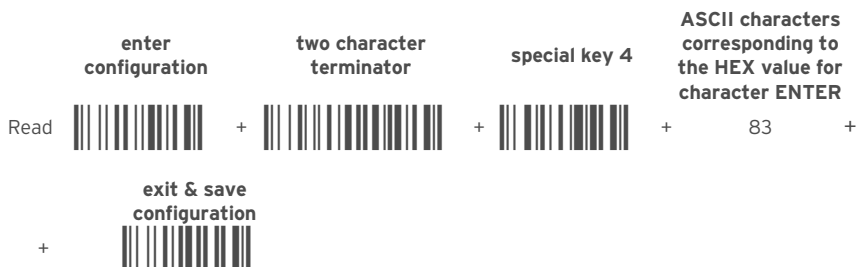
2. The following example allows setting Special Key 2 (defined in example 2 above) as header:



3. The following example allows setting Special Key 3 (defined in example 3 above) as header:



4. The following example allows setting Special Key 4 (defined in example 4 above) and ENTER character as terminators:



5.4.3 Address Stamping

It is possible to include the reader address in the message sent to the host. The Reader Address Stamping and the Cradle Address Stamping parameters consist of a 4-digit number in the range 0000 to 1999.

For message output format, refer to chapter 6.

5.4.4 Address Delimiter

The Address Delimiter allows a character to be included to separate the reader Address stamping field from the next field in the message. Any character can be included in the hexadecimal range from 00 to FE.

For message output format, refer to chapter 6.

5.4.5 Time Stamping Format

The Time Stamping parameter sets the format for hour and date information. It consists of 1 or 2 groups of numbers, each one made up of 6 decimal digits.

For example, setting the Hour/Minutes/Seconds/Month/Day/Year format, the information *17:03:16 on June 12, 2002* will be formatted as 170316061202.

5.4.6 Time Stamping Delimiter

The Time Stamping Delimiter allows a character to be included to separate the Time Stamping field from the next field in the message. Any character can be included in the hexadecimal range from 00 to FE.

5.5 POWER SAVE

5.5.1 Sleep State

When using interfaces other than USB, this mode allows the P in the reader to enter a “Sleep” state for minimum power consumption. For D-series readers, this command is only valid when hardware trigger type is selected.

Before entering Sleep mode, the following are verified:

- no commands coming from Host
- no data being transmitted to Host
- Enter Sleep Timeout ended (see section 5.5.2)

To exit Sleep mode press the trigger.

For M8300 series readers, sleep state is entered immediately after reading a code and is not configurable. To exit Sleep mode press the trigger.

When using the USB interface, this mode allows the device to manage Selective Suspend conditions generated by the Host Operating System in which optimizing low power consumption (ex. Windows Stand-by). It is possible to exit the Suspend mode either from the Host (ex. moving the mouse during Stand-by) or through the barcode reader. The latter, called Remote Wakeup, makes the device wake up the Host restoring the communication. Remote Wakeup is possible by pressing the trigger.

5.5.2 Enter Sleep Timeout

For readers that have the Sleep state enabled, this timeout determines when the reader will enter this state.

5.6 READING PARAMETERS

5.6.1 Trigger Signal

This mode determines how the reading phase is controlled when the hardware trigger operating mode is selected:

- trigger active level: the reader goes ON when the trigger is pressed and goes OFF when it is released
- trigger active pulse: the reader goes ON at the first trigger press and goes OFF only at a second press

5.6.2 Trigger Click

When enabled, it activates a "click" sound upon each trigger pressure.

5.6.3 Trigger-Off Timeout

When this timeout is selected, the reader turns OFF automatically after the desired period of time.

5.6.4 Reads per Cycle

In general, a **reading cycle** corresponds to the ON + OFF times of a device.

The resulting effects of this parameter on code reading depend on other related configuration conditions. Here are the definitions of ON and OFF times.

- For readers using the software trigger parameter (FLASH MODE), a reading cycle corresponds to the *flash on* + *flash off* times. Code reading takes place during the *flash on* time.
- For readers using the *hardware trigger* parameter, a reading cycle corresponds to a trigger press (ON) + one of the following OFF events:
 - trigger release (for *trigger active level*)
 - a second trigger press (for *trigger active pulse*)
 - trigger-off timeout* (see section 5.6.3).

When **one read per cycle** is selected, the device decodes only one code during the ON period and immediately turns the reader OFF. It is only possible to read another code when the next ON time occurs.

In **multiple reads per cycle**, the ON period is extended so that the device can continue decoding codes until an OFF event occurs. For software trigger mode, the *flash on* period is immediately reset after each read and therefore extended. If another code is decoded before the reset *flash on* period expires, it is again reset and the effect is that the device remains ON, decoding codes until the *flash on* or *timeout* period expires.

The Safety Time parameter should be used in this case to avoid unwanted multiple reading of the same code, see section 5.6.5.

5.6.5 Safety Time

Safety time prevents the device from immediately decoding the same code more than once. Same code consecutive reading can be disabled requiring the reader to be removed from the code (no decoding) for at least 400 ms, or a timeout can be set up to 9.9 seconds before the decoder will accept the same code. Reading is immediate if the code changes.

The safety time parameter is not applicable when reading stacked codes or when setting one read per cycle in hardware trigger operating mode, since these settings require voluntary action by the user.

5.7 DECODING PARAMETERS



CAUTION

These parameters are intended to enhance the decoding capability of the reader for particular applications. Used incorrectly, they can degrade the reading performance or increase the possibility of a decoding error.

5.7.1 Ink-Spread

The ink-spread parameter allows the decoding of codes, which are not perfectly printed because the page texture tends to absorb the ink.

5.7.2 Overflow Control

The overflow control parameter can be disabled when decoding codes printed on small surfaces, which do not allow the use of an overflow space.

This command does not affect code families 2/5, Code 128 and Code 93.

5.7.3 Interdigit Control

The interdigit control parameter verifies the interdigit spacing for code families Code 39 and Codabar.

5.8 ADVANCED FORMATTING

5.8.1 Match Conditions

Selecting an Advanced Formatting and specifying a Match restriction (Code Type, Code Length, Predefined Characters) the code will be transmitted according to the order of the defined formats.

For example, defining 2 formats where:

- Format 1: Match Code type = Code128
- Format 2: Match Code length = 15 and Match with Predefined Characters "DATA"

A Code128 "DATA:12345ABCDE" with code length 15 will be formatted following the Format 1.

To send the same code with the Format 2 it is necessary to invert the format order as follows:

- Format 1: Match Code length = 15 and Match with Predefined Characters "DATA"
- Format 2: Match Code type = Code128

5.9 RADIO PARAMETERS (M8300 SERIES ONLY)

5.9.1 Radio Protocol Timeout

This parameter sets the valid time to wait before transmission between the M8300 series reader and BC-80X0 cradle is considered failed.

This parameter should be set taking into consideration the radio traffic (number of readers in the same area).

If the RS-232 interface is used with ACK/NACK enabled, this parameter should be at least equal to the RX Timeout parameter for low traffic environments. It should be increased if there are many readers in the same area.

It can be set between 2 and 19 seconds.

5.9.2 Radio RX Timeout

When the scanner is used in a standalone layout (point-to-point or with multiple readers) it can be configured to receive “asynchronous” messages from the host at any time.

There are two modes which can enable the scanner to receive messages from the host:

1) **Enable “2 way” Communication Protocol** - After the transmission of each barcode, the scanner waits for an acknowledgement from the host¹. A message can be sent by the host accompanying this acknowledgement, or in place of it, to display something on the screen or execute a command (such as sound a beep sequence, turn an LED on or off, etc.). If no acknowledgement or message is received from the host within a programmable timeout duration, the radio will be switched off and an “error transmission” beep will be sounded.

2) **Independent of the Selected Protocol** - The scanner can be configured to keep the radio receiver “awake” for a defined period of time following each transmission. Any message coming from the host¹ before expiration of the timeout is accepted. The parameter “Radio RX Timeout” is used for specifying how long the scanner have to wait for a message after receiving each code transmission. In this mode, the radio can also be “awakened” by pressing the trigger. The scanner can receive a message only if it is linked to the Base (i.e. the scanner has been joined to the Base and has had at last one “valid” transmission after the last power-on). Setting the “Radio RX timeout” value to “00” specifies that the radio never goes into sleep mode (always awake the scanner can receive a message at any time). Choosing this setting will, of course, consume battery life more quickly.

¹See Section 6.2 for Host to Scanner message formatting.

5.9.3 Power-Off Timeout

If this command is enabled, after the desired timeout in hours, the PowerScan™ batteries are disconnected and all power consumption ceases. To restore power, press the trigger once. The reader will now be ready to read codes. Power-off does not affect configuration parameters.

5.9.4 Transmission Mode

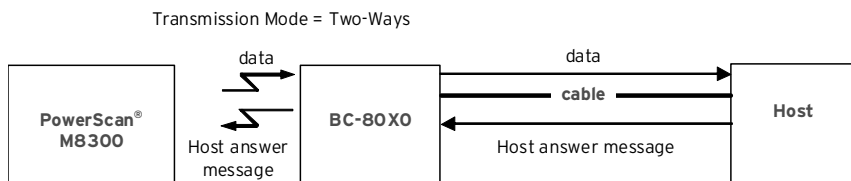
This parameter determines whether the reader receives responses or messages from the Host or not. In One-Way tx mode, neither Host nor cradle responds to the reader.

In Two-Way tx mode, the reader must receive a response from either the cradle or the Host.

The cradle responds (empty message) to the reader, only after good transmission to the Host, for the following conditions: ACK/NACK enabled, see section 5.1.2; WEDGE or PEN interface. For these conditions, it is suggested to prolong the Radio Protocol Timeout, see section 5.9.1.

Enabling Two-Way tx mode temporarily disables FIFO buffering see section 5.1.3.

With ACK/NACK disabled, the Host responds to the reader (through the cradle) with an answer message (message to reader display or command to reader), see section 6.2 and the following figure.



5.9.5 Beeper Control for Radio Response

For M8300 series readers, the data entry good read tone normally results in two beeps; the first indicates that the reader has decoded the code; the second indicates whether BC-80X0 has received the data.

This can be changed according to the following selections:

- ◆ Normal: both good decode and good receptions are signaled (two beeps).
- ◆ Only Good Decode: only the first beep indicating a good read is signaled.
- ◆ Only Good Reception: only the second beep indicating a good reception is signaled.
- ◆ Off: Neither good read nor good reception beeps are signaled.

For all configurations, any transmission errors will always be signaled.

5.9.6 Single Store

When single store mode is enabled, if the PowerScan™ M8300 fails to transmit a code to the cradle, it enters a special operating mode that prevents the user from reading barcodes. When such operating mode is entered, the trigger no longer enables barcode reading but is used to retry transmission itself for the number of attempts selected in configuration. Once the transmission is successful the reader returns to the standard mode. If transmission is not successful after the number of configured attempts, the code is discarded.

Single store may be useful if you often read codes at the limit of the coverage area and there is a chance that code transmission can fail. In such case single store allows you to move to a more favorable position or location (i.e. closer to the cradle) and retry transmission without the necessity of re-reading the code since it is already stored in the reader.

Conversely, if single store is disabled, and the user wants to retry transmission, the code must be read again, and therefore the attempt must be made from basically the same location. If the user gives up, he does not know if the transaction was successful. (Actually the transmission could have been successful but the cradle may have been unable to acknowledge the message). There are applications in which there is no risk of transmission failure. In such cases it may be better to disable single store so that the user perceives a more consistent behavior of the trigger in that it always corresponds to code reading.

5.9.7 Batch Mode

This Operating Mode allows storing read codes in the internal reader memory. The stored codes are transmitted to the base station at a later time according to the type of batch mode selected.

Batch mode can be enabled either manually (normal batch mode) or automatically.

Normal batch mode temporarily suspends radio communication between reader and base station allowing codes to be stored in the reader on a FIFO (first in, first out) basis. This can be useful, for example, if codes must be read from a location where there is no radio network. Upon returning to the system working area, this mode requires reading the **Start Normal Batch Transmission** barcode to successively transmit the list of stored codes to the base station. The FIFO management assures that the first code read will be the first code to be transmitted to the base station.

The **Delete Batch Data** barcode allows canceling all barcode data stored in the reader.

Automatic batch mode allows codes to be stored in the reader on a FIFO basis whenever the reader is out of radio range. In this case radio communication is not suspended and transmission is attempted after each code read. If transmission cannot be successfully completed, then the code is added to the list. When the reader

returns in range, transmission of the codes to the base station resumes automatically, according to the selected communication protocol, upon simply pressing and releasing the trigger or by successfully reading a new code.

In batch mode, the selected Transmission Mode determines the behavior of the reader at the time the list of codes is transmitted. If One-way mode is enabled, the codes are transmitted one after the other without interruption. In Two-way mode, after transmitting each code, the reader waits for the Host answer message to be shown on the display. Therefore, in Two-way transmission mode and normal batch mode, the **Start Normal Batch Transmission** barcode must be read after each code to continue; whereas with automatic batch mode, just pull and release the trigger after each code.

3-KEY MODEL

Each code is listed on the reader display together with its identifying position number and its total number of characters. The three keys under the display have the following function in batch mode:

	Key	Function
▲	(left) Key	Scroll up in list
ENTER	(center) Key	Delete highlighted code
▼	(right) Key	Scroll down in list

The code which has a transmission pending is shown on the display in reverse video, indicating that it cannot be deleted.

5.9.8 Find Me (PowerScan™ M8300 only)

If enabled, after a timeout of a few minutes in which PowerScan™ M8300 is not used, it enters stand-by mode and its green LED starts blinking in order to signal its location.

5.10 DISPLAY PARAMETERS (SOME M8300 MODELS ONLY)

5.10.1 Display Mode

The user can control the reader display behavior according to the following selections:

Normal mode: When a barcode is read with the reader:

- The code is sent to the Host.
- The reader display is not cleared. Therefore if any previous data was displayed on the reader screen it remains.
- There is no Local Echo to the reader display.

Clear Display After Decode mode: When a barcode is read with the reader:

- The code is sent to the Host.
- The reader display is cleared. Therefore if any previous data was displayed on the reader screen it is cancelled and the screen remains blank.
- There is no Local Echo of the code to the reader display.







Local Echo mode: When a barcode is read with the reader:

- The code is sent to the Host.
- The reader display is cleared.
- The code is also sent to the reader display (Local Echo).
- The cursor is positioned after the last printed character on the reader display.

Host messages sent to the reader are always written to the reader display.

5.11 CONFIGURATION EDITING COMMANDS

The following commands carry out their specific function and then exit the configuration environment.

Command	Description
	Restore PowerScan™ reader default configuration (see the relative Quick Reference Guide for default settings)
	Transmit the PowerScan™ D8330 or PowerScan™ M8300 software release
	Transmit PowerScan™ reader configuration in ASCII format. This command is not effective with Pen emulation interface.
	Restore BC-80X0 default configuration (see the relative Quick Reference Guide for default settings)
	Transmit the BC-80X0 Software release.
	Transmit BC-80X0 configuration in ASCII format. This command is not effective with Pen emulation interface.

5.12 CUSTOM DEFAULT CONFIGURATION

Read the following code to set the reader user-defined configuration as custom default configuration:

Save User-defined Configuration as Custom Default



Read the following code whenever you need to restore the custom default configuration:

Restore Custom Default Configuration



5.13 CODE TYPE RECOGNITION

This procedure allows the reader to enter a particular state during which it reads and transmits to the Host information about the family type of codes unknown to the user (with the exception of MSI, Code 49 and Code 16k code types). It is also possible to read and transmit configuration strings without interpreting them. All codes are read ignoring the check digit.

Follow the given procedure:

- ① Read the following code to enter the code type recognition mode:



code type recognition



- ② Read existing codes whose family type you need to check.
- ③ Read the following code to return to the reader's normal functioning:

exit code type recognition mode



5.14 CONFIGURATION COPYING COMMANDS

5.14.1 Copy PowerScan™ D8330 Series

Procedure:

- ① Connect the **master** (correctly configured reader) and the **slave** (reader to be configured) together through two RS-232 serial interface cables and external power supply. Accessory cables and power supply are available from your Psion distributor to provide this connection.

RS-232 Cables: CAB471 & CAB472

Power Supply: PG5

- ② Using the **slave** reader, read the Restore Default barcode and then the RS-232 interface barcode from chapter 4 of this manual or from the Quick Reference Guide.
- ③ With the **master** reader, read the Configuration Copy barcode below.



The configuration will be copied from the master to the slave reader. The slave reader signals the end of the procedure with a series of beeps.

NOTE: The master reader can be configured for any interface.

5.14.2 Copy PowerScan™ M8300 Series

Procedure:

- ① Using the **slave** reader and its BC-80X0 cradle, follow the initialization procedure in chapter 4 of this manual or from the Quick Reference Guide.
- ② With the **master** PowerScan™ M8300 (correctly configured reader), read the Copy Configuration barcode below. Then place it onto an BC-80X0 cradle within 10 seconds. The reader will beep indicating the configuration has been copied.

The configuration will be simultaneously sent over the RS-232 interface of the BC-80X0. If this causes undesired effects disconnect the RS-232 cable between the PC and BC-80X0 during this process.

Copy Configuration



- ③ With the **slave** PowerScan™ M8300, read the Get Configuration barcode below. Then place it onto the **same** BC-80X0 cradle used in the step above. The slave reader's address will not be changed.

Get Configuration



The configuration will be copied from the master to the slave PowerScan™ M8300. The slave PowerScan™ M8300 signals the end of the procedure with a series of beeps. It is now ready to be used with its own BC-80X0 cradle.

- ④ Repeat the procedure above to configure other slave readers. The BC-80X0 can continue to configure slave readers until it receives another command or data.

5.14.3 Copy BC-80X0

Procedure:

- ① Using the **slave** reader and its BC-80X0 cradle, read the Restore Default barcode, set the radio address, and then read the RS-232 interface barcode from chapter 4 of this manual or from the Quick Reference Guide.
- ② Connect the **master** BC-80X0 and the **slave** BC-80X0 (cradle to be configured) together through two RS-232 serial interface cables and external power supply. Accessory cables and power supply are available from your Psion distributor to provide this connection.
RS-232 Cables: CAB471 & CAB472
Power Supply: PG12
- ③ Read the Configuration Copy barcode below with a reader. Then place it onto the **master** BC-80X0 cradle.

Copy Configuration



The configuration will be copied from the master BC-80X0 to the slave BC-80X0. The reader signals the end of the procedure with a series of beeps.

- ④ Repeat the procedure above to configure other slave cradles.

NOTE: The master BC-80X0 can be configured for any interface.

5.15 DEFAULT PARAMETERS FOR POS TERMINALS

The default values of the RS-232 and Data Format parameters for POS terminals are listed in the following table:

	NIXDORF Mode A	FUJITSU	ICL Mode
RS-232 Group			
Baud Rate	9600	9600	9600
Parity	Odd	None	Even
Data Bits	8	8	8
Stop Bits	1	1	1
Handshaking	Hardware (RTS/CTS)	None	RTS always ON
ACK/NACK Protocol	Disabled	Disabled	Disabled
FIFO	Disabled	Enabled	Enabled
Inter-Character Delay	Disabled	Disabled	Disabled
RX Timeout	9.9 sec	2 sec	9.9 sec
Serial Trigger Lock	Disabled	Disabled	Disabled
Data Format Group			
Code Identifier	Custom	Custom	Custom
Header	No Header	No Header	No Header
Terminator	CR	CR	CR
Field Adjustment	Disabled	Disabled	Disabled
Code Length TX	Not Transmitted	Not Transmitted	Not Transmitted
Character Replacement	Disabled	Disabled	Disabled
Address Stamping	Disabled	Disabled	Disabled
Address Delimiter	Disabled	Disabled	Disabled
Time Stamping	Disabled	Disabled	Disabled
Time Delimiter	Disabled	Disabled	Disabled

The table below lists all the Code Identifiers available for the POS terminals:

CODE	NIXDORF Mode A	FUJITSU	ICL Mode
UPC-A	AO	A	A
UPC-E	CO	E	E
EAN-8	B	FF	FF
EAN-13	A	F	F
Code 39	M	None	C [code length]
Codabar	N	None	N [code length]
Code 128	K	None	L [code length]
Interleaved 2 of 5	I	None	I [code length]
Code 93	L	None	None
Industrial 2 of 5	H	None	H [code length]
UCC/EAN 128	P	None	L [code length]
MSI	O	None	None
GS1 DATABAR™	E	None	None
Other	None	None	None

5.16 FIRMWARE UPGRADE

Device firmware upgrades can be performed from your PC through either a USB or serial connection (RS-232). Download the free configuration software tool Aladdin from the original manufacturer's web site: <http://www.scanning.datalogic.com> and install it by clicking on the setup file.

Procedure:

- ① Connect the device to the PC via USB or serial connection (RS-232).
- ② Launch Aladdin on your PC. From the menu, select Tools > firmware upgrade.
- ③ Read the code below and position the reader onto the cradle:

prepare device for firmware upgrade



OR

Press the cradle button if present (to update the cradle only).

The device will automatically be reset.

- ④ Proceed with the firmware upgrade (see the Aladdin on-line help for details).



CAUTION

Do not interrupt firmware upgrade downloading for any reason.

6 MESSAGE FORMATTING

6.1 STANDARD MESSAGE FORMATTING

The system always provides scanner to host data communication using the following message formatting:

Output Message from PowerScan™ D8330 or standard PowerScan™ M8300 Stand-alone Towards Host

[Header] [Scanner_Addr] [Scanner_Addr_delimiter]] [Cradle_Addr] [Cradle_Addr_delimiter]
 [Time stamp] [Ts_delimiter] [Code ID] [Code Length] CODE [Terminator]
 [Items in square brackets are optional.]

Output Message from PowerScan™ M8300 STAR-System™ Towards Host

[Time stamp] [Ts_delimiter] [Header] [Code ID] [Code Length] CODE [Terminator]
 [Items in square brackets are optional.]

For PowerScan™ M8300 models with display, if the RS-232 interface is selected for communication between the Host and the BC-80X0 cradle, then the following additional communications between Host and Scanner can occur:

- The Host can send messages to any scanner associated with that cradle to control the Scanner's display, LEDs and beeper.
- The Scanner can send up to 3 user-defined characters to the Host using the 3 command keys on the Scanner.

6.2 MESSAGES FROM HOST TO READER

The general format to enable the Scanner for a 2 way communication is:

[Scanner_Addr] [Scanner_Addr_delimiter] MESSAGE [CR]

NOTE:

- If you have enabled the Scanner Address Stamping or the Scanner Address Delimiter, you **must** specify them in every message.

The format for other asynchronous messages is:

[Scanner_Addr] [Scanner_Addr_delimiter] [DC2] MESSAGE [CR]

where DC2 is ASCII 0x12 (^R) character.

- If you have **not** enabled the Scanner Address Stamping or the Scanner Address Delimiter, you **must not** specify them. In this case all messages will be implicitly addressed to the 'binded' Scanner of the cradle directly connected to the serial line.
- The Scanner can only receive messages if two-way mode is enabled. (See section 5.9.4, "Transmission Mode", the command is on page 159).
- Messages cannot start with '\$+' because they would be interpreted as a configuration command.
- You can send a message to the Scanner only while it is on. This happens when it has sent a message to the host and the radio timeout has not yet expired. (See section 5.9.1, "Radio Protocol Timeout"; command is on page 129).
- If you want to control the Scanner's beeper from the host, you will also probably want to disable the good transmission beep that is emitted when the code is received from the cradle. (See command on page 85).

The message field can store plain text and escape sequences.

- Escape sequences are interpreted as commands.
- Plain text is directly printed on the display. If writing beyond the end of line, the display does not wrap automatically. Extra characters are ignored. Control characters are not interpreted (i.e. LF, FF, etc.).

6.2.1 Cursor Control

ESC [<i>n</i> A	Up <i>n</i> rows, no scroll
ESC [<i>n</i> B	Down <i>n</i> rows, no scroll
ESC [<i>n</i> C	Right <i>n</i> columns
ESC [<i>n</i> D	Left <i>n</i> columns
ESC [G	CR
ESC [<i>r</i> ; <i>c</i> H	Move to row <i>r</i> , column <i>c</i> (ESC[1;1H is the upper left character position of the display)
ESC D	Down 1 row, with scroll
ESC E	CR and cursor down 1 row with scroll
ESC M	Up 1 row and scroll

NOTES:

- Since CR is used as the message terminator, you must use ESC [G or ESC E to print a CR.
- The cursor row position **is not** affected by the currently selected font. The display always has 4 rows, so when writing with the large font, actually two rows are written to: the current one and the one below it. You will need two ESC E commands to step from one row to the next when using the large font.
- The cursor column position **is** affected by the currently selected font. Therefore, column 6 is 36 pixels from the left border only if you last selected the 6x8 font; otherwise it could be 48 or 72 pixels from the left border.

6.2.2 Font Selection

ESC [0 m	Normal mode
ESC [7 m	Reverse mode
ESC # 4	Large font: subsequent characters are written on the current row and the row below it using the 12x16 font which allows for two rows of eight characters on the display.
ESC # 5	Normal font: subsequent characters are written using the 6x8 font, which allows for four rows of sixteen characters on the display.
ESC # 7	Medium font: subsequent characters are written using the 8x8 font, which allows for four rows of twelve characters on the display.

6.2.3 Clearing Display

ESC [0 K	From cursor position to end of line inclusive
ESC [1 K	From beginning of line to cursor position (not inclusive)
ESC [2 K	Entire line
ESC [0 J	From cursor position to end of display inclusive
ESC [1 J	From beginning of display to cursor position (not inclusive)
ESC [2 J	Entire display; moves cursor to upper left corner on display

6.2.4 LED and Beeper Control

ESC [0 q	Emit short High tone + short delay
ESC [1 q	Emit short Low tone + short delay
ESC [2 q	Emit long Low tone + short delay
ESC [3 q	Emit good read tone
ESC [4 q	Emit bad tx tone
ESC [5 q	Wait 100 ms
ESC [6 q	Turn on the green LED
ESC [7 q	Turn off the green LED
ESC [8 q	Turn on the red LED
ESC [9 q	Turn off the red LED

The LED control escape sequences are intended to activate the LEDs for short periods of time and can be used in combination with the Beeper. The LED and Beeper will be controlled by the system after the entire command sequence is interpreted.

Example:

ESC [6 q ESC [3 q ESC [7 q Turns on the green LED, emits a good read tone, and turns off the green LED.

ESC [6 q ESC [5 q ESC [7 q Turns on the green LED for 100 ms and then turns off the green LED.

6.2.5 Setting RTC

ESC [0 p d d m m y y	Set date to day, month, year
ESC [1 p h h m m	Set time to hours, minutes; seconds are automatically set to 00.

6.3 MESSAGES FROM SCANNER COMMAND KEYS

6.3.1 PowerScan M8300 keypad

The PowerScan™ M8300 series scanners with display have 3 command keys that can each be associated with a character to send to the host.

By pressing the keys on the scanner, the associated character with its relative message formatting is sent to the Host. For example, keys can be used to select items from a menu sent to the scanner display by the application program.

The general format is:

[Header] [Scanner_Addr] [Scanner_Addr_delimiter]] [Cradle_Addr] [Cradle_Addr_delimiter]
[Time stamp] [Ts_delimiter] [Code ID] [Code Length] KeyID [Terminator]

[Items in square brackets are optional.]

The messages are handled by the system as if they were barcodes, that's why **KeyID** can have so many fields appended to it. If in your application there is some chance of reading a 1-char barcode identical to **KeyID**, the way you can distinguish between the two is to enable the Code ID: The **KeyID** is the only 1-character long EAN 8 code.

Refer to section 5.3 for a complete description of the optional message fields in square brackets.

The default characters associated with each key (**KeyID**) are shown in the following table:

Default Key Identifiers		
	Key	KeyID
▲	(left) Key	'<'
ENTER	(center) Key	'='
▼	(right) Key	'>'

7 TECHNICAL FEATURES

7.1 POWERSCAN™ D8330

Electrical Features	POWERSCAN™ D8330	POWERSCAN™ D8330 AR
Power Supply	4 to 30 VDC	
Max. Consumption		
@ 4V	420 mA	500 mA
@ 5V	310 mA	370 mA
@ 30 V	62 mA	70 mA
Sleep Mode	4 mA	4 mA
Reading Indicators	Good Read LED (green) Good Read Spot (green), Beeper	
Host Interfaces		
RS-232	300 to 38400 baud	
WEDGE	IBM AT or PS/2, XT, PC Notebook, IBM SURE1, IBM 3153, 31xx, 32xx, 34xx, 37xx terminals, Wyse terminals, Digital VT terminals, Apple ADB Bus supported	
PEN Emulation	Selectable minimum pulse from 200 S to 1.2 mS	
USB	USB-KBD, USB-KBD-ALT-MODE, USB-KBD APPLE, USB-COM, USB-IBM-Table Top, USB-IBM-Hand Held	
Laser Features	D8330	D8330 AR
Light Source	VLD between 630~680 nm	
Scan Rate	35 ± 5 scans/sec	
Power (max) in mW	0.9 mW	1.3 mW
Scan Angle	42°	13.5° ± 0.7
PCS minimum (Manufacturer's Test Chart)	15%	25%
Maximum Resolution	0.076 mm (3 mils)	0.19 mm (7.5 mils)
Reading Field Width	see reading diagrams (section 7.6)	
Laser Safety Class	Class 2 EN 60825-1/CDRH	
Environmental Features		
Working Temperature	-30° to +50 °C / -22° to +122 °F	
Storage Temperature	-30° to +70 °C / -22° to +158 °F	
Humidity	90% non condensing	
Drop resistance (on concrete)	IEC 68-2-32 Test ED 2 m	
Protection class	IP65	
Mechanical Features		
Weight (without cable)	about 295 g (10.4 oz)	
Dimensions	205 x 114 x 69 mm (8.07 x 4.49 x 2.72 in)	
Cable length	2 m (6 ft 6 in)	
Material	Polycarbonate molded with rubber	

7.2 POWERSCAN™ M8300

Electrical and General Features		
Battery Type	2150 Li-Ion battery pack	
Recharge Time	max. 4 hours with external power supply max 10 hours with Host power	
Operating autonomy (continuous reading)	60,000 reads (typical)	
Display (Only available with some models)	LCD 4 lines x 16 chars Programmable font and backlight	
Indicators	Good Read LED (green) Good Read Spot (green), Beeper	
Laser Features	M8300	M8300 AR
Light Source	VLD between 630~680 nm	
Scan Rate	35 ± 5 scans/sec	
Power (max) in mW	0.9 mW	1.3 mW
Scan Angle	42°	13.5° ± 0.7
PCS minimum (Manufacturer's Test Chart)	15%	25%
Maximum Resolution	0.076 mm (3 mils)	0.19 mm (7.5 mils)
Reading Field Width	see reading diagrams (section 7.6)	
Laser Safety Class	CLASS 2 EN 60825-1 / CDRH	
Environmental Features		
Working Temperature	-20° to +50 °C / -4° to +122 °F	
Storage Temperature	-20° to +70 °C / -4° to +158 °F	
Humidity	90% non condensing	
Drop resistance (on concrete) IEC 68-2-32 Test ED	2 m	
Protection Class	IP65 (IP64 for models with display)	
Mechanical Features		
Weight (with batteries)	about 400 g (14.10 oz)	
Dimensions	212 x 109 x 71 mm (8.34 x 4.49 x 2.79 in)	
Material	Polycarbonate molded with rubber	

7.3 BC-80X0 / C-8000

Electrical and General Features		
Supply Voltage		
	External Power	10 to 30 VDC
	Host Power	5 VDC $\pm 10\%$
Power Consumption		
	External Power	max. 10 W (charging)*
	Host Power	max. 500 mA (charging)
Indicators		Ext. Power /Data yellow LED Host Power/Data yellow LED Reader batt. state green/red LED Aux. batt. state green/red LED (BC-8000/C-8000 only) beeper
Recharge Time		
	External Power	max. 4 hours with 2150 mAh Li-Ion battery
	Host Power	max. 10 hours with 2150 mAh Li-Ion battery
Host Interfaces		
		BC-80X0
		C-8000
RS-232		300 to 38400 baud
WEDGE		9600 baud
		IBM AT or PS/2, XT, PC Notebook, IBM SURE1, IBM 3153, 31xx, 32xx, 34xx, 37xx terminals, Wyse terminals, Digital VT terminals, Apple ADB Bus supported
PEN Emulation		Not supported
		Selectable minimum pulse from 200 μ s to 1.2 ms
USB		Not supported
		USB-KBD, USB-KBD-ALT-MODE, USB-KBD APPLE, USB-COM, USB- IBM-Table Top, USB-IBM-Hand Held
		USB-COM
Environmental Features		
Working Temperature		-20° to +50 °C / -4° to +122 °F**
Storage Temperature		-20° to +70 °C / -4° to +158° F
Humidity		90% non condensing
Protection		IP40
Mechanical Features		
Weight without cable		about 380 g / 13.4 oz
Dimensions (without antenna)		204 x 108 x 95 mm / 9.44 x 4.25 x 3.74 in
Material		ABS

* Having a switching regulator inside, the BC-80X0 and C-8000 draw the same power, regardless of the supply voltage. i.e. as the input voltage increases the current drawn decreases.

**Batteries must be charged at a temperature ranging from 0° to +40 °C / +32° to +104 °F.

7.4 SYSTEM AND RADIO FEATURES

Radio Features	European Models	USA Models
Radio Frequency	433.92 MHz	910 MHz
Bit Rate	19200	36800
Range (in open air)	50 m	30 m
System Configurations	BC-8000 model only	STARGATE™
Maximum number of devices per base station	32	255
Maximum number of devices in the same reading area	2000	
Maximum number of base stations in network	16 (including cradle Master)	

7.5 STATUS INDICATORS

The scanner has two indicator LEDs and a Beeper. The BC-8000 and C-8000 cradles have four LED indicators (three for BC-8010 model) and a Beeper. They signal several operating conditions, which are described in the tables below.

H = high tone

L = low tone

POWERSCAN™ D8330/M8300 READER START-UP

Beeper	Meaning
L L L L	Parameters loaded correctly
H H H H long tones	Parameter loading error, reading or writing error in the non volatile memory
H L H L	Hardware error in EEPROM

POWERSCAN™ D8330/M8300 READER CONFIGURATION

Beeper	Meaning
H H H H	Correct entry or exit from Configuration mode
L	Good read of a command
L L L	Command read error

POWERSCAN™ D8330/M8300 READER DATA ENTRY

Beeper¹	LED	Good Read Spot	Meaning
one beep ²	ON	ON	Correct read of a code in normal mode
H L long			TX buffer full (when FIFO is enabled) or TX error between PowerScan™ M8300 and BC-8000
H long	ON	ON	Successful advanced format concatenation
H H H			Timeout expired - operation not completed
H H long			Error in advanced data formatting
	OFF	OFF	Ready to read a code

1 Only the Beeper Intensity command can modify these signals.

2 The data entry good read tone is user-configurable with all the Beeper commands in the Reading Parameters section.

For M-series readers, normally this results in two beeps; the first indicates that the reader has decoded the code, the second indicates whether BC-80X0 has received the data. See also section 5.9.5.

POWERSCAN™ M8300 POWER

Beeper	LED	Meaning
10 short H	10 short blinks	Low Battery
H M L		Power off

H = high tone

M = medium tone

L = low tone

POWERSCAN™ M8300 BIND, JOIN, COPY COMMANDS

Beeper	LED	Meaning
	Blinking	Command accepted; reader ready to be inserted into the cradle
L		Success
H L long tones		Failure

BC-80X0/C-8000 POWER/COMMUNICATION

Aux LED		Host LED	Meaning
Yellow		Yellow	
OFF		OFF	Device off
ON			Power applied through an external power supply
		ON	Power applied through the Host
Flashing		Flashing	Transmission over the Host port

BC-80X0/C-8000 CHARGE STATUS

Reader LED			Meaning
Red	Green	Beeper	
OFF	OFF		No reader battery inserted
ON			Reader battery in charge
	ON	single beep	Reader battery completely charged
Flashing orange			Reader battery fault
Alternating red/green		repetitive beep	Charging out of temperature range, over-current or over-voltage conditions
Alternating red/green every 30 seconds		beep every 30 seconds	Reader not correctly inserted onto cradle, no charging takes place
Spare LED (not for BC-8010)			Meaning
Red	Green	Beeper	
OFF	OFF		No Spare battery inserted in the SBS-3000 slot
ON			Spare battery in charge
	ON		Spare battery completely charged
Flashing orange			Spare battery fault
Alternating red/green		repetitive beep	Charging out of temperature range, over-current or over-voltage conditions
Alternating red/green every 30 seconds		beep every 30 seconds	Spare battery not correctly inserted into SBS-3000, no charging takes place

7.6 Reading Tables

POWERSCAN™ D8330/M8300

mil	Typical reading distance with good quality codes
5	2.1 - 13.3 cm / 0.8 - 5.2 in
7,5	3.5 - 24.2 cm / 1.4 - 9.5 in
10	2.9 - 42.8 cm / 1.1 - 16.8 in
13	2.3 - 55.1 cm / 0.9 - 21.7 in
20	6.3 - 78.5 cm / 2.5 - 30.9 in
40	2.5 - 97.8 cm / 1.0 - 38.5 in

POWERSCAN™ D8330/M8300/AR models

mil	Typical reading distance with good quality codes
7,5	18 - 50 cm / 7.0 - 19.7 in
10	18 - 85 cm / 7.0 - 33.5 in
15	15 - 165 cm / 5.9 - 65.0 in
20	12 - 210 cm / 4.7 - 82,7 in
40	18 - 375 cm / 7.0 - 147.6 in
55	25 - 485 cm / 9.8 in - 15.9 ft
100 (refl. Paper)	1.5 - 12.5 m / 4.9 - 41.0 ft

A HOST CONFIGURATION STRINGS

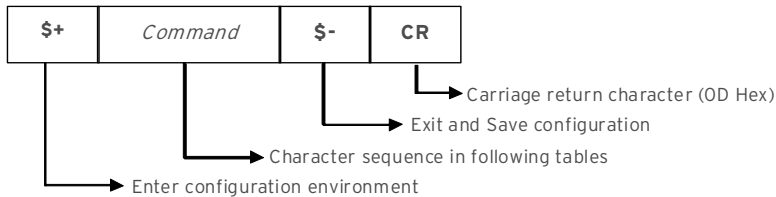
In this section we provide a description of how to modify the device configuration using serial strings sent from the Host.



NOTE

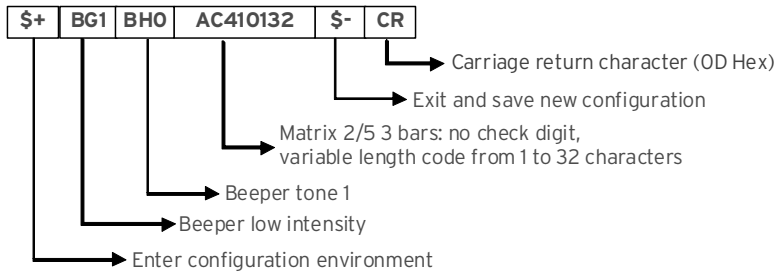
This method requires the RS-232 interface.

The device configuration can be changed by receiving commands from the Host through the serial interface. When this method is used, the programming sequence format is the following:



Example:

Multiple command programming sequence:



Each configuration parameter setting removes the condition previously active for that parameter.



NOTE

The device buffer can contain about 400 characters. If your programming string goes over this value, you must split it into separate groups and send each group after a delay of at least 3 seconds to give the reader time to empty the buffer and interpret the commands.

SERIAL CONFIGURATION STRINGS

SPECIAL CONFIGURATION COMMANDS	
DESCRIPTION	STRING
Enter Configuration	\$+
Exit and Save Configuration	\$-
Restore Default	\$+\$*
Transmit Software Release (not for PEN emulation)	\$+\$!
Transmit Device Configuration in ASCII (not for PEN emulation)	\$+\$&
Set Custom Default	\$+\$0
Restore Custom Default	\$+\$1

These commands do not require \$-.

INTERFACE SELECTION		
DESCRIPTION		STRING
RS-232	Standard	CP0
	ICL Mode	CM0
	Fujitsu	CM1
	Nixdorf Mode A	CM2ECO
WEDGE	for IBM AT	CP500
	for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-break keyboard	CP501
	for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-only keyboard	CP502
	Keyboard Type for IBM Terminals 31xx, 32xx, 34xx, 37xx	FK0
	typewriter	FK1
	advanced	FK1
	for IBM XT	CP503
	for IBM Terminal 3153	CP504
	for IBM PC Notebook	CP505
	for IBM SURE1	CP506
	for IBM AT - ALT mode	CP507
	for IBM PC Notebook - ALT mode	CP508
	for Wyse Terminal - ANSI Keyboard	CP509
	for Wyse Terminal - PC Keyboard	CP510
	for Wyse Terminal - ASCII Keyboard	CP511
	for Wyse Terminal - VT220 style Keyboard	CP514
	for Digital Terminals VT2xx/3xx/4xx	CP512
PEN EMULATION		CP6
USB	USB-KBD	UA03
	USB-KBD-ALT-MODE	UA04
	USB-KBD-APPLE	UA05
	USB-COM	UA02
	USB-IBM-Table Top	UA00
	USB-IBM-Hand Held	UA01

RS-232		
DESCRIPTION		STRING
Baud Rate	300	CD1
	600	CD2
	1200	CD3
	2400	CD4
	4800	CD5
	9600	CD6
	19200	CD7
	38400	CD8
Parity	none	CC0
	even	CC1
	odd	CC2
Data Bits	7	CA0
	8	CA1
	9	CA2
Stop Bits	1	CB0
	2	CB1
Handshaking	disable	CE0
	RTS/CTS	CE1
	XON/XOFF	CE2
	RTS always On	CE3
ACK/NACK Protocol	disable	ER0
	enable	ER1
FIFO	disable	EC0
	enable	EC1
Inter-character Delay (<i>ms</i>)		CK00 - CK99
RX Timeout (<i>100 ms</i>)		CL00 - CL99
Serial Trigger Lock	disable	CR0
	enable and select characters	CR1ab

a = Hex values representing an ASCII character from **00** to **FE** enabling the device trigger.

b = HEX values representing an ASCII character from **00** to **FE** inhibiting the device trigger.

USB		
DESCRIPTION		STRING
USB-COM		
Handshaking	disable	CE0
	RTS/CTS	CE1
	XON/XOFF	CE2
	RTS always ON	CE3
ACK/NACK Protocol	disable	ER0
	enable	ER1
FIFO	disable	EC0
	enable	EC1
Inter-character Delay (<i>ms</i>)		CK00 - CK99
RX Timeout (<i>100 ms</i>)		CL00 - CL99
Serial Trigger Lock	disable	CR0
	enable	CR1 ab
USB-KBD		
Keyboard Nationality (not for USB-KBD-ALT-MODE)	Belgian	FJ7
	English (UK)	FJ4
	French	FJ2
	German	FJ3
	Italian	FJ1
	Spanish	FJ6
	Swedish	FJ5
	USA	FJ0
Keyboard Nationality (IBM AT compatible only)	Japanese	FJ8
	Russian (Latin)	FJ9
	Russian (Cyrillic)	FJA
	Hungarian	FJB
	Slovenian, Croatian, Serbian (Latin)	FJC
	Romanian	FJD
	Czech Republic	FJE
FIFO	disable	EC0
	enable	EC1
Delays	Inter-Character (<i>ms</i>)	CK00 - CK99
	Inter-Code (<i>s</i>)	FG00 - FG99
USB Keyboard Speed	normal	UT10
	fast	UT01

a = Hex values representing an ASCII character from **00** to **FE** enabling the device trigger.

b = HEX values representing an ASCII character from **00** to **FE** inhibiting the device trigger.

WEDGE		
DESCRIPTION		STRING
Keyboard Nationality	Belgian	FJ7
	English (UK)	FJ4
	French	FJ2
	German	FJ3
	Italian	FJ1
	Spanish	FJ6
	Swedish	FJ5
	USA	FJ0
Keyboard Nationality (IBM AT compatible only)	Japanese	FJ8
	Russian (Latin)	FJ9
	Russian (Cyrillic)	FJA
	Hungarian	FJB
	Slovenian, Croatian, Serbian (Latin)	FJC
	Romanian	FJD
	Czech Republic	FJE
Caps Lock	caps Lock ON	FE1
	caps Lock OFF	FE0
Caps Lock Auto-Recognition (IBM AT compatible only)	disable	FPO
	enable	FP1
Num Lock	toggle num lock	FL1
	num lock unchanged	FL0
Delays	Inter-Character (<i>ms</i>)	CK00 - CK99
	Inter-Code (<i>s</i>)	FG00 - FG99
Control Character Emulation	Ctrl + Shift + Key	FO0
	Ctrl + Key	FO1

PEN		
DESCRIPTION		STRING
Operating Mode	interpret (does not require \$+ or \$-)	\$]
	transparent (does not require \$+ or \$-)	\$[
Minimum Output Pulse	200µs	DG0
	400µs	DG1
	600µs	DG2
	800µs	DG3
	1 ms	DG4
	1.2 ms	DG5
Conversion to Code 39 and Code 128	disable conversion to Code 39 (D series only)	DA0
	enable conversion to Code 39	DA1
	enable conversion to Code 128 (M series only)	DA2

PEN (continued)		
DESCRIPTION		STRING
Output Level	normal	DD0
	inverted	DD1
Idle Level	normal	DE0
	inverted	DE1
Overflow	narrow overflow	DH0
	medium overflow	DH1
	wide overflow	DH2
Inter-block Delay (100 ms)		CK00-CK99

NETWORK		
DESCRIPTION		STRING
RS-485 Network	Disable Network	RZ0
	Enable RS-485 Slave	RZ1
	Enable RS-485 Master	RZ2
Slave Address Range	Minimum Address	JB0000-1999
	Maximum Address	JC0000-1999
Network Baud Rate	9600	JE0
	19200	JE1
	38400	JE2
Network Warning Message	not transmitted	JG0
	transmitted	JG1
Transmission Warning Message	not transmitted	JH0
	transmitted	JH1
Master Header	no header	JA00
	one character	JA01x
	two characters	JA02xx
	three characters	JA03xxx
	four characters	JA04xxxx
	five characters	JA05xxxxx
	six characters	JA06xxxxxx
	seven characters	JA07xxxxxxx
Master Terminator	eight characters	JA08xxxxxxxx
	no terminator	JA10
	one character	JA11x
	two characters	JA12xx
	three characters	JA13xxx
	four characters	JA14xxxx
	five characters	JA15xxxxx
	six characters	JA16xxxxxx
	seven characters	JA17xxxxxxx
	eight characters	JA18xxxxxxxx

x = Hex value from **00** to **FE** representing an ASCII character

DATA FORMAT		
NOT FOR PEN EMULATION INTERFACES		
DESCRIPTION		STRING
Code Identifier	disable	EB0
	Manufacturer standard	EB1
	AIM standard	EB2
	custom	EB3
Custom Code Identifier		EHabc
Headers	no header	EA00
	one character	EA01 x
	two characters	EA02 xx
	three characters	EA03 xxx
	four characters	EA04 $xxxx$
	five characters	EA05 $xxxxx$
	six characters	EA06 $xxxxxx$
	seven characters	EA07 $xxxxxxx$
Terminators	eight characters	EA08 $xxxxxxxx$
	no terminator	EA10
	one character	EA11 x
	two characters	EA12 xx
	three characters	EA13 xxx
	four characters	EA14 $xxxx$
	five characters	EA15 $xxxxx$
	six characters	EA16 $xxxxxx$
	seven characters	EA17 $xxxxxxx$
	eight characters	EA18 $xxxxxxxx$

a = ASCII character.

b, c, x = HEX values representing an ASCII character.

a = ASCII character of the MANUFACTURER STANDARD Code Identifier from the table on page 69.

b = Hex value of the first Custom Code Identifier character from **00** to **FD**;

FF = disable Code Identifier

c = Hex value of the second Custom Code Identifier character from **00** to **FD**;

FF = disable second character of Custom Code Identifier

x = Hex value from **00** to **FE**

DATA FORMAT (continued)		
<i>NOT FOR PEN EMULATION INTERFACES</i>		
DESCRIPTION		STRING
Code Length Tx	not transmitted	EE0
	transmitted in variable-digit format	EE1
	transmitted in fixed 4-digit format	EE2
Field Adjustment	disable	EF0
	right addition	EF <i>a0d</i>
	left addition	EF <i>a1d</i>
	right deletion	EF <i>a2d</i>
	left deletion	EF <i>a3d</i>
Field Adjustment Character		EG <i>e</i>
Character Replacement	disable character replacement	EO0
	first character replacement	EO1 <i>afg</i>
	second character replacement	EO2 <i>afg</i>
	third character replacement	EO3 <i>afg</i>
Address Stamping	disable reader address stamping	RU0
	enable reader address stamping	RU1
	disable cradle address stamping	RW0
	enable cradle address stamping	RW1
Address Delimiter	disable reader address delimiter	RV0
	enable reader address delimiter and select character	RV1 <i>h</i>
	disable cradle address delimiter	RY0
	enable cradle address delimiter and select character	RY1 <i>h</i>
Time Stamping	disable	IL0
	hour/minutes/seconds/month/day/year	IL1
	hour/minutes/seconds/day/month/year	IL2
	hour/minutes/seconds	IL3
	month/day/year	IL4
	day/month/year	IL5
Time Stamping Delimiter	disable time stamping delimiter	IMS0
	enable time stamping delimiter	IMS1
	select time stamping delimiter character	IM1 <i>h</i>

a = ASCII character.

d = a number from the Hex/Numeric Table

e, f, g, h = HEX values representing an ASCII character

a = ASCII character of the MANUFACTURER STANDARD Code Identifier from the table on page 69.

d = a number in the range **01-32** from the Hex/Numeric Table

e = Hex value from **00** to **FE**

f = Hex value of the character to be replaced from **00** to **FE**

g = Hex value of the new character to insert from **00** to **FE**

FF = replace with no new character (remove character)

h = a HEX value in the range from **00 - FE** representing the ASCII character.

POWER SAVE		
DESCRIPTION		STRING
Sleep State (only for D8330 series)	disable	BQ0
	enable	BQ1
Enter Sleep Timeout (100 ms)		BR00 - BR99

READING PARAMETERS		
DESCRIPTION		STRING
Trigger Type	software trigger	BK0
	hardware trigger	BK1
	always on	BK3
Trigger Signal	trigger active level	BA0
	trigger active pulse	BA1
Trigger Click	disable	Bc0
	enable	Bc1
Trigger-off Timeout (s)		BD00 - BD99
FLASH ON (100 ms)		BB001 - BB099
FLASH OFF (100 ms)		BB101 - BB199
Reads per Cycle	one read	BC0
	multiple reads	BC1
Safety Time (100 ms)		BE00 - BE99
Beeper Intensity	very low intensity	BG0
	low intensity	BG1
	medium intensity	BG2
	high intensity	BG3
Beeper Tone	tone 1	BH0
	tone 2	BH1
	tone 3	BH2
	tone 4	BH3
Beeper Type	monotone	BJ0
	bitonal	BJ1
Beeper Length	long	BI0
	short	BI1
Good Read Spot Duration	disable	BV0
	short	BV1
	medium	BV2
	long	BV3
Aiming System	disabled	Bj0
	enabled	Bj1
Cradle Beeper Intensity	disable	Ji0
	low intensity	Ji1
	medium intensity	Ji2
	high intensity	Ji3

DECODING PARAMETERS		
DESCRIPTION		STRING
Ink-spread	disable	AX0
	enable	AX1
Overflow Control	disable	AW1
	enable	AW0
Interdigit Control	disable	AV0
	enable	AV1
Puzzle Solver™	disable	AU0
	enable	AU1
Decoding Safety	one read	ED0
	two reads	ED1
	three reads	ED2
	four reads	ED3

CODE SELECTION			
DESCRIPTION			STRING
DISABLE ALL FAMILY CODES			AZ0
EAN/UPC	disable EAN/UPC family		AA0
	EAN 8/EAN 13/UPC A/UPC E	without ADD ON	AA1
		with ADD ON	AA5
		with and without ADD ON	AA8
	EAN 8/EAN 13	without ADD ON	AA3
		with ADD ON 2 ONLY	AAK
		with ADD ON 5 ONLY	AAL
		with ADD ON 2 AND 5	AA6
	UPC A/UPC E	without ADD ON	AA4
		with ADD ON 2 ONLY	AAM
		with ADD ON 5 ONLY	AAN
		with ADD ON 2 AND 5	AA7
	EAN/UPC with and without Add On no Autodiscrimination		AA8Ad0
	EAN/UPC Autodiscrimination Add On by Prefix		AA8Ad1
	Select Prefixes	cancel all selections	ET0
		378/379	ET1378ET2379
		434/439	ET3434ET4439
		414/419	ET5414ET6419
		977	ET7977
		978	ET8978
		979	ET9979
	EAN 8 check digit transmission	disable	AAG0
		enable	AAG1
	EAN 13 check digit transmission	disable	AAH0
		enable	AAH1

CODE SELECTION (continued)			
DESCRIPTION			STRING
	UPC A check digit transmission	disable	AAI0
		enable	AAI1
	UPC E check digit transmission	disable	AAJ0
		enable	AAJ1
	conversions	UPC E to UPC A	AAA
		UPC E to EAN 13	AAB
		UPC A to EAN 13	AAC
		EAN 8 to EAN 13	AAD
	ISBN Conversion codes	enable ISBN	AP1
		enable ISSN	AP2
enable ISBN and ISSN		AP3	
disable ISBN and ISSN		AP0	
Code 39	disable Code 39 family		AB0
	Standard	no check digit control	AB11
		check digit control and transmission	AB12
		check digit control without transmission	AB13
	Full ASCII	no check digit control	AB21
		check digit control and transmission	AB22
		check digit control without transmission	AB23
	CIP 39		AB3
	Code 32		AB4
	code length		AB*xxxx
2/5	disable Code 2/5 family		AC0
	Interleaved 2/5	no check digit control	AC11xxxx
		check digit control and transmission	AC12xxxx
		check digit control without transmission	AC13xxxx
	Normal 2/5 5 bars	no check digit control	AC21xxxx
		check digit control and transmission	AC22xxxx
		check digit control without transmission	AC23xxxx
	Industrial 2/5 (IATA)	no check digit control	AC31xxxx
		check digit control and transmission	AC32xxxx
		check digit control without transmission	AC33xxxx
	Matrix 2/5 3 bars	no check digit control	AC41xxxx
		check digit control and transmission	AC42xxxx
		check digit control without transmission	AC43xxxx
	CIP/HR		AC5

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

The minimum code length must always be less than or equal to the maximum.

The maximum code length for all codes is 99 characters:

Examples:

0132 = variable length from 1 to 32 digits in the code.

1010 = 10 digit code length only.

CODE SELECTION (continued)			
DESCRIPTION			STRING
Codabar	disable Codabar family		ADO
	Standard	no start/stop character equality control nor transmission	AD111
		no start/stop character equality control but transmission	AD112
		start/stop character equality control but no transmission	AD121
		start/stop character equality control and transmission	AD122
	ABC Codabar	no start/stop character equality control but transmission	AD212
	Codabar ABC forced concatenation		AD232
	code length		AD*xxxx
	start/stop character case in transmission	lower case	ADA0
		upper case	ADA1
Code 128	disable Code 128 family		A10
	enable Code 128 - control without transmission of check digit		A111
	enable EAN 128 - control without transmission of check digit		A121
	Transmit GS before Code	disable	EQ0
		enable	EQ1
	ISBT 128	enable ISBT 128	A131
	code length		A1Lxxxx
Code 93	disable Code 93 family		AK0
	enable Code 93 - control without transmission of check digit		AK1
MSI	disable the family		AE0
	no check		AE1
	MOD10 no tx		AE2
	MOD10 with tx		AE3
	MOD11-MOD10 no tx		AE4
	MOD11-MOD10 with tx		AE5
	MOD10-MOD10 no tx		AE6
	MOD10-MOD10 with tx		AE7

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

The minimum code length must always be less than or equal to the maximum.

The maximum code length for all codes is 99 characters:

Examples:

0132 = variable length from 1 to 32 digits in the code.

1010 = 10 digit code length only.

CODE SELECTION (continued)		
DESCRIPTION		STRING
Code 11	disable the family	AG0
	no check	AG1
	Type C with tx	AG21
	Type C no tx	AG22
	Type K with tx	AG31
	Type K no tx	AG32
	Type C and K with tx	AG41
	Type C and K no tx	AG42
Code 16K	disable	AJ0
	enable	AJ1
Code 49	disable	AM0
	enable	AM1
GS1 DataBar™ Codes	disable the family	AQ0
	disable GS1 DataBar Expanded Linear and Stacked	AQ10
	enable GS1 DataBar Expanded Linear and Stacked	AQ11
	disable GS1 DataBar Limited	AQ20
	enable GS1 DataBar Limited	AQ21
	disable GS1 DataBar Linear and Stacked	AQ30
	enable GS1 DataBar Linear and Stacked	AQ31

RADIO PARAMETERS		
DESCRIPTION		STRING
Radio Protocol Timeout	enable (seconds)	RH02-RH19
Radio RX Timeout		RR00-RR99
Power-Off Timeout		RP00-RP99
Transmission Mode	one-way	R10
	two-way	R11
Beeper Control For Radio Response	normal	BF0
	only good decode	BF1
	only good reception	BF2
	off	BF3
Single Store	disable	RO0
	one attempt	RO1
	two attempts	RO2
	three attempts	RO3
	four attempts	RO4
	five attempts	RO5
	six attempts	RO6
	seven attempts	RO7
	eight attempts	RO8
	nine attempts	RO9
Find Me	disable	Bk0
	enable	Bk1

DISPLAY PARAMETERS		
DESCRIPTION		STRING
Date		IAddmmyy
Time		IBhhmm
Contrast	lighter	IC0
	darker	IC1
Font Size	small	ID0
	medium	ID1
	large	ID2
Backlight	off	IE0
	on	IE1
Display-Off Timeout		IF <i>a</i>
Display Mode	normal	IG0
	local echo	IG1
	clear display after decode	IG2
Keypad	disabled keys	IK0
	enable and select KeyID characters	IK1 <i>bbb</i>

ddmmyy = numbers from the Hex/Numeric Table representing day, month, year

hhmm = numbers from the Hex/Numeric Table representing hour, minutes

a = a number from the Hex/Numeric Table

b = HEX values representing an ASCII character

a = a number in the range **00-99** (sec.) from the Hex/Numeric Table

00 = Timeout disabled (always on).

b = 3 Hex values from **00** to **FE** representing the left, center and right keys.

FF = KeyID disabled.

B CODE IDENTIFIER TABLE

2/5 Interleaved



2/5 Industrial



2/5 normal 5 bars



2/5 matrix 3 bars



EAN 8



EAN 13



UPC A



UPC E



EAN 8 with 2 ADD ON



EAN 8 with 5 ADD ON



EAN 13 with 2 ADD ON



EAN 13 with 5 ADD ON



UPC A with 2 ADD ON



UPC A with 5 ADD ON



UPC E with 2 ADD ON



UPC E with 5 ADD ON



Code 39



Code 39 Full ASCII



CODABAR



ABC CODABAR



Code 128



EAN 128



Code 93



CIP/39



CIP/HR



Code 32



ISBT 128



MSI



Code 16K



Code 11



Code 49



GS1 DATABAR Expanded Linear and Stacked



GS1 DATABAR Limited



GS1 DATABAR 14 Linear and Stacked



C HEX AND NUMERIC TABLE

CHARACTER TO HEX CONVERSION TABLE					
char	hex	char	hex	char	hex
NUL	00	*	2A	U	55
SOH	01	+	2B	V	56
STX	02	,	2C	W	57
ETX	03	-	2D	X	58
EOT	04	.	2E	Y	59
ENQ	05	/	2F	Z	5A
ACK	06	0	30	[	5B
BEL	07	1	31	\	5C
BS	08	2	32	]	5D
HT	09	3	33	^	5E
LF	0A	4	34	`	5F
VT	0B	5	35		60
FF	0C	6	36	a	61
CR	0D	7	37	b	62
SO	0E	8	38	c	63
SI	0F	9	39	d	64
DLE	10	:	3A	e	65
DC1	11	;	3B	f	66
DC2	12	<	3C	g	67
DC3	13	=	3D	h	68
DC4	14	>	3E	i	69
NAK	15	?	3F	j	6A
SYN	16	@	40	k	6B
ETB	17	A	41	l	6C
CAN	18	B	42	m	6D
EM	19	C	43	n	6E
SUB	1A	D	44	o	6F
ESC	1B	E	45	p	70
FS	1C	F	46	q	71
GS	1D	G	47	r	72
RS	1E	H	48	s	73
US	1F	I	49	t	74
SPACE	20	J	4A	u	75
!	21	K	4B	v	76
"	22	L	4C	w	77
#	23	M	4D	x	78
\$	24	N	4E	y	79
%	25	O	4F	z	7A
&	26	P	50	{	7B
'	27	Q	51	|	7C
(	28	R	52	}	7D
)	29	S	53	~	7E
		T	54	DEL	7F

CHARACTER TO HEX CONVERSION TABLE (continued)								
char	decimal	hex	char	decimal	hex	char	decimal	hex
€	128	80	ª	170	AA	Û	213	D5
◻	129	81	«	171	AB	Ü	214	D6
,	130	82	¬	172	AC	×	215	D7
ENTER	131	83	-	173	AD	Ø	216	D8
TAB	132	84	®	174	AE	Ù	217	D9
F1	133	85	—	175	AF	Ú	218	DA
F2	134	86	°	176	B0	Û	219	DB
F3	135	87	±	177	B1	Ü	220	DC
F4	136	88	²	178	B2	Ý	221	DD
F5	137	89	³	179	B3	Þ	222	DE
F6	138	8A	´	180	B4	ß	223	DF
F7	139	8B	µ	181	B5	à	224	EO
F8	140	8C	¶	182	B6	á	225	E1
F9	141	8D	·	183	B7	â	226	E2
F10	142	8E	¸	184	B8	ã	227	E3
F11	143	8F	¹	185	B9	ä	228	E4
F12	144	90	º	186	BA	å	229	E5
HOME	145	91	»	187	BB	æ	230	E6
END	146	92	¼	188	BC	ç	231	E7
Pg UP	147	93	½	189	BD	è	232	E8
Pg Down	148	94	¾	190	BE	é	233	E9
↑	149	95	¿	191	BF	ê	234	EA
↓	150	96	À	192	C0	ë	235	EB
←	151	97	Á	193	C1	ì	236	EC
→	152	98	Â	194	C2	í	237	ED
ESC	153	99	Ã	195	C3	î	238	EE
CTRL(Right)	154	9A	Ä	196	C4	ï	239	EF
€	155	9B	Å	197	C5	ð	240	FO
œ	156	9C	Æ	198	C6	ñ	241	F1
◻	157	9D	Ç	199	C7	ò	242	F2
ž	158	9E	È	200	C8	ó	243	F3
ÿ	159	9F	É	201	C9	ô	244	F4
NBSP	160	A0	Ê	202	CA	õ	245	F5
ï	161	A1	Ë	203	CB	ö	246	F6
ç	162	A2	Ì	204	CC	÷	247	F7
£	163	A3	Í	205	CD	ø	248	F8
€	164	A4	Î	206	CE	ù	249	F9
¥	165	A5	Ï	207	CF	ú	250	FA
+	166	A6	Ð	208	D0	û	251	FB
§	167	A7	Ñ	209	D1	ü	252	FC
..	168	A8	Ò	210	D2	ý	253	FD
©	169	A9	Ó	211	D3	Reserved	254	FE
			Ô	212	D4	Reserved	255	FF

HEX/NUMERIC BAR CODES



0



1



2



3



4



5



6



7



8



9



A



B



C



D



E



F



Backspace

NOTES
